lyche-numerical-linear-algebra: equation evidence

Display equations

Identifier	Page	Conf.	LaTeX source	Rendered	Image
lyche-numerical-linear-algebra_EQ0706 **[conf 0.001]**	253	0.001	`\begin{array}{rl} \boldsymbol{T} \boldsymbol{V}+ \boldsymbol{V} \boldsymbol{T} & =h^{2} \boldsymbol{F} \\ \boldsymbol{V}^{\boldsymbol{V}=\boldsymbol{S} \boldsymbol{X} \boldsymbol{S}} \boldsymbol{T} \boldsymbol{S} \boldsymbol{X} \boldsymbol{S}+ \boldsymbol{S} \boldsymbol{X} \boldsymbol{S} \boldsymbol{T} & =h^{2} \boldsymbol{F} \\ \stackrel{\boldsymbol{S}() \boldsymbol{S}}{\Longleftrightarrow} \boldsymbol{S} \boldsymbol{T} \boldsymbol{S} \boldsymbol{X} \boldsymbol{S}^{2}+\boldsymbol{S}^{2} \boldsymbol{X} \boldsymbol{S} \boldsymbol{T} \boldsymbol{S} & =h^{2} \boldsymbol{S} \boldsymbol{F} \boldsymbol{S}=h^{2} \boldsymbol{G} \\ \stackrel{\boldsymbol{T}}{\Leftrightarrow} \boldsymbol{S}^{\mathbf{2}} \boldsymbol{D} & \boldsymbol{S} \boldsymbol{X} \boldsymbol{S}^{2}+\boldsymbol{S}^{2} \boldsymbol{X} \boldsymbol{S}^{2} \boldsymbol{D} \\ \boldsymbol{S}^{2} & =h^{2} \boldsymbol{G} \\ \Longleftrightarrow & \boldsymbol{I} /(2 h) \end{array}`	$\begin{array}{rl} \boldsymbol{T} \boldsymbol{V}+ \boldsymbol{V} \boldsymbol{T} & =h^{2} \boldsymbol{F} \\ \boldsymbol{V}^{\boldsymbol{V}=\boldsymbol{S} \boldsymbol{X} \boldsymbol{S}} \boldsymbol{T} \boldsymbol{S} \boldsymbol{X} \boldsymbol{S}+ \boldsymbol{S} \boldsymbol{X} \boldsymbol{S} \boldsymbol{T} & =h^{2} \boldsymbol{F} \\ \stackrel{\boldsymbol{S}() \boldsymbol{S}}{\Longleftrightarrow} \boldsymbol{S} \boldsymbol{T} \boldsymbol{S} \boldsymbol{X} \boldsymbol{S}^{2}+\boldsymbol{S}^{2} \boldsymbol{X} \boldsymbol{S} \boldsymbol{T} \boldsymbol{S} & =h^{2} \boldsymbol{S} \boldsymbol{F} \boldsymbol{S}=h^{2} \boldsymbol{G} \\ \stackrel{\boldsymbol{T}}{\Leftrightarrow} \boldsymbol{S}^{\mathbf{2}} \boldsymbol{D} & \boldsymbol{S} \boldsymbol{X} \boldsymbol{S}^{2}+\boldsymbol{S}^{2} \boldsymbol{X} \boldsymbol{S}^{2} \boldsymbol{D} \\ \boldsymbol{S}^{2} & =h^{2} \boldsymbol{G} \\ \Longleftrightarrow & \boldsymbol{I} /(2 h) \end{array}$	$\begin{array}{r} \boldsymbol{T} \boldsymbol{V}+ \boldsymbol{V} \boldsymbol{T} =h^{2} \boldsymbol{F} \\ \stackrel{\boldsymbol{V}=\boldsymbol{S} \boldsymbol{X} \boldsymbol{S}}{\Longleftrightarrow} \boldsymbol{T} \boldsymbol{S} \boldsymbol{X} \boldsymbol{S}+ \boldsymbol{S} \boldsymbol{X} \boldsymbol{S} \boldsymbol{T} =h^{2} \boldsymbol{F} \\ \stackrel{\boldsymbol{S}() \boldsymbol{S}}{\Longleftrightarrow} \boldsymbol{S} \boldsymbol{T} \boldsymbol{S} \boldsymbol{X} \boldsymbol{S}^{2}+\boldsymbol{S}^{2} \boldsymbol{X} \boldsymbol{S} \boldsymbol{T} \boldsymbol{S} =h^{2} \boldsymbol{S} \boldsymbol{F} \boldsymbol{S}=h^{2} \boldsymbol{G} \\ \stackrel{\boldsymbol{T} \boldsymbol{S}=\boldsymbol{S} \boldsymbol{D}}{\Longleftrightarrow} \boldsymbol{S}^{2} \boldsymbol{D} \boldsymbol{X} \boldsymbol{S}^{2}+\boldsymbol{S}^{2} \boldsymbol{X} \boldsymbol{S}^{2} \boldsymbol{D}=h^{2} \boldsymbol{G} \\ \stackrel{\boldsymbol{S}^{2}=\boldsymbol{I} /(2 h)}{\Longleftrightarrow} \boldsymbol{D} \boldsymbol{X}+\boldsymbol{X} \boldsymbol{D}=4 h^{4} \boldsymbol{G} . \end{array}$
lyche-numerical-linear-algebra_EQ0729 **[conf 0.002]**	258	0.002	`\begin{array}{lll} \left(\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}\right)_{p, q} & =\omega_{2 m}^{j(2 k)} & =\omega_{m}^{j k}, \\ \left(\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}\right)_{p+m, q} & =\omega_{2 m}^{(j+m)(2 k)} & =\omega_{m}^{(j+m) k} \\ \left(\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}\right)_{p, q+m} & =\omega_{2 m}^{j(2 k+1)} & =\omega_{2 m}^{j} \omega_{m}^{j k}, \\ \left(\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}\right)_{p+m, q+m} & =\omega_{2 m}^{j+m}\right)(2 k+1) & =\omega_{2 m}^{j+m} \omega_{m}^{j+m}\right) k \\ & (j+m & \end{array}`	$\begin{array}{lll} \left(\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}\right)_{p, q} & =\omega_{2 m}^{j(2 k)} & =\omega_{m}^{j k}, \\ \left(\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}\right)_{p+m, q} & =\omega_{2 m}^{(j+m)(2 k)} & =\omega_{m}^{(j+m) k} \\ \left(\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}\right)_{p, q+m} & =\omega_{2 m}^{j(2 k+1)} & =\omega_{2 m}^{j} \omega_{m}^{j k}, \\ \left(\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}\right)_{p+m, q+m} & =\omega_{2 m}^{j+m}\right)(2 k+1) & =\omega_{2 m}^{j+m} \omega_{m}^{j+m}\right) k \\ & (j+m & \end{array}$	$\begin{array}{lll} \left(\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}\right)_{p, q} & =\omega_{2 m}^{j(2 k)} & =\omega_{m}^{j k}, \\ \left(\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}\right)_{p+m, q} & =\omega_{2 m}^{(j+m)(2 k)} & =\omega_{m}^{(j+m) k} \\ \left(\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}\right)_{p, q+m} & =\omega_{2 m}^{j(2 k+1)} & =\omega_{2 m}^{j} \omega_{m}^{j k}, \\ \left(\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}\right)_{p+m, q+m} & =\omega_{2 m}^{(j+m)(2 k+1)} & =\omega_{2 m}^{j+m} \omega_{m}^{(j+m) k} \\ & & =-\omega_{2 m}^{j} \omega_{m}^{j k} . \end{array}$

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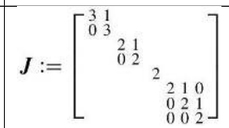
lyche-numerical-linear-algebra_EQ0326 (5.18)	133	0.118	`\begin{aligned} & \boldsymbol{Q}_{1}:=\left[\begin{array}{llll} \boldsymbol{q}_{1}, \ldots, \boldsymbol{q}_{n} \end{array}\right], \\ & \boldsymbol{R}_{1}:= \\ & \boldsymbol{q}_{j}:=\frac{ \boldsymbol{v}_{j}}{\left|\boldsymbol{v}_{j}\right |_{2}}, \quad j=1, \ldots, n \text { and } \\ & {\left[\begin{array}{ccccc} \left|\boldsymbol{v}_{1}\right |_{2} & \boldsymbol{a}_{2}^{T} \boldsymbol{q}_{1} & \boldsymbol{a}_{3}^{T} \boldsymbol{q}_{1} & \cdots & \boldsymbol{a}_{n-1}^{T} \boldsymbol{q}_{1} \\ 0 & \left|\boldsymbol{v}_{2}\right|_{2} & \boldsymbol{a}_{3}^{T} \boldsymbol{q}_{2} & \cdots & \boldsymbol{a}_{n-1}^{T} \boldsymbol{q}_{2} \\ & 0 & \left|\boldsymbol{v}_{3}\right|_{2} & \cdots & \boldsymbol{a}_{n-1}^{T} \boldsymbol{q}_{2} \\ & & \ddots & \ddots & \boldsymbol{a}_{n}^{T} \boldsymbol{q}_{3} \\ & & & \ddots & \vdots \\ & & & \left|\boldsymbol{v}_{n-1}\right|_{2} & \boldsymbol{a}_{n}^{T} \boldsymbol{q}_{n-1} \\ & & & 0 & \left|\boldsymbol{v}_{n}\right|_{2} \end{array}\right] .} \end{aligned}`	$\boldsymbol{Q}_1 := \left[\ \boldsymbol{q}_1, \ldots, \boldsymbol{q}_n\ \right],$ $\boldsymbol{R}_1 :=$ $\boldsymbol{q}_j := \frac{\boldsymbol{v}_j}{\left\|\boldsymbol{v}_j\right\|_2}, \quad j = 1, \ldots, n$ and $\left[\begin{array}{ccccc} \left\|\boldsymbol{v}_1\right\|_2 & \boldsymbol{a}_2^T \boldsymbol{q}_1 & \boldsymbol{a}_3^T \boldsymbol{q}_1 & \cdots & \boldsymbol{a}_{n-1}^T \boldsymbol{q}_1 \\ 0 & \left\|\boldsymbol{v}_2\right\|_2 & \boldsymbol{a}_3^T \boldsymbol{q}_2 & \cdots & \boldsymbol{a}_{n-1}^T \boldsymbol{q}_2 \\ & 0 & \left\|\boldsymbol{v}_3\right\|_2 & \cdots & \boldsymbol{a}_{n-1}^T \boldsymbol{q}_2 \\ & & \ddots & \ddots & \boldsymbol{a}_n^T \boldsymbol{q}_3 \\ & & & \ddots & \vdots \\ & & & \left\|\boldsymbol{v}_{n-1}\right\|_2 & \boldsymbol{a}_n^T \boldsymbol{q}_{n-1} \\ & & & 0 & \left\|\boldsymbol{v}_n\right\|_2 \end{array}\right].$	$\boldsymbol{Q}_1 := [\boldsymbol{q}_1, \ldots, \boldsymbol{q}_n], \quad \boldsymbol{q}_j := \frac{\boldsymbol{v}_j}{\left\|\boldsymbol{v}_j\right\|_2}, \quad j = 1, \ldots, n$ *and* $\boldsymbol{R}_1 := \left[\begin{array}{cccccc} \left\|\boldsymbol{v}_1\right\|_2 & \boldsymbol{a}_2^T \boldsymbol{q}_1 & \boldsymbol{a}_3^T \boldsymbol{q}_1 & \cdots & \boldsymbol{a}_{n-1}^T \boldsymbol{q}_1 & \boldsymbol{a}_n^T \boldsymbol{q}_1 \\ 0 & \left\|\boldsymbol{v}_2\right\|_2 & \boldsymbol{a}_3^T \boldsymbol{q}_2 & \cdots & \boldsymbol{a}_{n-1}^T \boldsymbol{q}_2 & \boldsymbol{a}_n^T \boldsymbol{q}_2 \\ & 0 & \left\|\boldsymbol{v}_3\right\|_2 & \cdots & \boldsymbol{a}_{n-1}^T \boldsymbol{q}_3 & \boldsymbol{a}_n^T \boldsymbol{q}_3 \\ & & \ddots & \ddots & \vdots & \vdots \\ & & & \ddots & \left\|\boldsymbol{v}_{n-1}\right\|_2 & \boldsymbol{a}_n^T \boldsymbol{q}_{n-1} \\ & & & & 0 & \left\|\boldsymbol{v}_n\right\|_2 \end{array}\right].$
lyche-numerical-linear-algebra_EQ0029	31	0.138	`\begin{array}{ccc} a_{11} x_{1}+a_{12} x_{2}+\cdots+ & a_{1 n} x_{n}=b_{1} \\ a_{21} x_{1}+a_{22} x_{2}+\cdots+ & a_{2 n} x_{n}= & b_{2} \\ \vdots & \vdots & \vdots \\ a_{m1} x_{1}+a_{m2} x_{2}+\cdots+ & \vdots \\ a_{mn} x_{n} & =b_{m} \end{array}`	$\begin{array}{ccc} a_{11} x_{1}+a_{12} x_{2}+\cdots+ & a_{1 n} x_{n}=b_{1} \\ a_{21} x_{1}+a_{22} x_{2}+\cdots+ & a_{2 n} x_{n}= & b_{2} \\ \vdots & \vdots & \vdots \\ a_{m1} x_{1}+a_{m2} x_{2}+\cdots+ & \vdots \\ a_{mn} x_{n} & =b_{m} \end{array}$	$\begin{array}{cccc} a_{11} x_{1} & + a_{12} x_{2} & + \cdots + & a_{1 n} x_{n} & = b_{1} \\ a_{21} x_{1} & + a_{22} x_{2} & + \cdots + & a_{2 n} x_{n} & = b_{2} \\ \vdots & \vdots & & \vdots & \vdots \\ a_{m1} x_{1} & + a_{m2} x_{2} & + \cdots + & a_{mn} x_{n} & = b_{m} \end{array}$

Identifier	Page	Conf.	LaTeX source	Rendered	Image
lyche-numerical-linear-algebra_EQ0630	229	■ 0.167	\begin{aligned} {\left[\begin{array}{cc} \boldsymbol{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \boldsymbol{0} \end{array}\right]\left[\begin{array}{l} \boldsymbol{u}_{i} \\ \boldsymbol{v}_{i} \end{array} \right] } & =\left[\begin{array}{c} \boldsymbol{A} \boldsymbol{v}_{i} \\ \boldsymbol{A}^{*} \boldsymbol{u}_{i} \end{array}\right]=\left[\begin{array}{l} \alpha_{i} \boldsymbol{u}_{i} \\ \alpha_{i} \boldsymbol{v}_{i} \end{array}\right]= \alpha_{i}\left[\begin{array}{l} \boldsymbol{u}_{i} \\ \boldsymbol{v}_{i} \end{array}\right], \quad i=1, \ldots, r, \\ {\left[\begin{array}{cc} \mathbf{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \mathbf{0} \end{array}\right]\left[\begin{array}{c} \boldsymbol{u}_{i} \\ -\boldsymbol{v}_{i} \end{array}\right] } & =\left[\begin{array}{c} -\boldsymbol{A} \boldsymbol{v}_{i} \\ \boldsymbol{A}^{*} \boldsymbol{u}_{i} \end{array}\right]=\left[\begin{array}{c} -\alpha_{i} \boldsymbol{u}_{i} \\ \alpha_{i} \boldsymbol{v}_{i} \end{array}\right]=- \alpha_{i}\left[\begin{array}{c} \boldsymbol{u}_{i} \\ -\boldsymbol{v}_{i} \end{array}\right], \quad i=1, \ldots, r, \\ {\left[\begin{array}{cc} \mathbf{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \mathbf{0} \end{array}\right]\left[\begin{array}{c} \boldsymbol{u}_{i} \\ \mathbf{0} \end{array}\right] } & =\left[\begin{array}{c} \mathbf{0} \\ \boldsymbol{A}^{*} \boldsymbol{u}_{i} \end{array}\right]=\left[\begin{array}{l} \mathbf{0} \\ \mathbf{0} \end{array} \right]=0\left[\begin{array}{c} \boldsymbol{u}_{i} \\ \mathbf{0} \end{array}\right], \quad i=r+1, \ldots, m, \\ {\left[\begin{array}{cc} \mathbf{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \mathbf{0} \end{array}\right]\left[\begin{array}{c} \mathbf{0} \\ \boldsymbol{v}_{i} \end{array}\right] } & =\left[\begin{array}{c} \boldsymbol{A} \boldsymbol{v}_{i} \\ \mathbf{0} \end{array}\right]=\left[\begin{array}{l} \mathbf{0} \\ \mathbf{0} \end{array}\right]=0\left[\begin{array}{c} \mathbf{0} \\ \boldsymbol{v}_{i} \end{array}\right], \quad i=r+1, \ldots, n \end{aligned}	$\begin{aligned} {\left[\begin{array}{cc} \boldsymbol{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \boldsymbol{0} \end{array}\right]\left[\begin{array}{c} \boldsymbol{u}_{i} \\ \boldsymbol{v}_{i} \end{array} \right] } & =\left[\begin{array}{c} \boldsymbol{A} \boldsymbol{v}_{i} \\ \boldsymbol{A}^{*} \boldsymbol{u}_{i} \end{array}\right]=\left[\begin{array}{l} \alpha_{i} \boldsymbol{u}_{i} \\ \alpha_{i} \boldsymbol{v}_{i} \end{array}\right]= \alpha_{i}\left[\begin{array}{l} \boldsymbol{u}_{i} \\ \boldsymbol{v}_{i} \end{array}\right], \quad i=1, \ldots, r, \\ {\left[\begin{array}{cc} \boldsymbol{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \boldsymbol{0} \end{array}\right]\left[\begin{array}{c} \boldsymbol{u}_{i} \\ -\boldsymbol{v}_{i} \end{array}\right] } & =\left[\begin{array}{c} -\boldsymbol{A} \boldsymbol{v}_{i} \\ \boldsymbol{A}^{*} \boldsymbol{u}_{i} \end{array}\right]=\left[\begin{array}{c} -\alpha_{i} \boldsymbol{u}_{i} \\ \alpha_{i} \boldsymbol{v}_{i} \end{array}\right]=- \alpha_{i}\left[\begin{array}{c} \boldsymbol{u}_{i} \\ -\boldsymbol{v}_{i} \end{array}\right], \quad i=1, \ldots, r, \\ {\left[\begin{array}{cc} \boldsymbol{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \boldsymbol{0} \end{array}\right]\left[\begin{array}{c} \boldsymbol{u}_{i} \\ \boldsymbol{0} \end{array}\right] } & =\left[\begin{array}{c} \boldsymbol{0} \\ \boldsymbol{A}^{*} \boldsymbol{u}_{i} \end{array}\right]=\left[\begin{array}{l} \boldsymbol{0} \\ \boldsymbol{0} \end{array} \right]=0\left[\begin{array}{c} \boldsymbol{u}_{i} \\ \boldsymbol{0} \end{array}\right], \quad i=r+1, \ldots, m, \\ {\left[\begin{array}{cc} \boldsymbol{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \boldsymbol{0} \end{array}\right]\left[\begin{array}{c} \boldsymbol{0} \\ \boldsymbol{v}_{i} \end{array}\right] } & =\left[\begin{array}{c} \boldsymbol{A} \boldsymbol{v}_{i} \\ \boldsymbol{0} \end{array}\right]=\left[\begin{array}{l} \boldsymbol{0} \\ \boldsymbol{0} \end{array}\right]=0\left[\begin{array}{c} \boldsymbol{0} \\ \boldsymbol{v}_{i} \end{array}\right], \quad i=r+1, \ldots, n \end{aligned}$	$\begin{aligned} {\left[\begin{array}{cc} \boldsymbol{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \boldsymbol{0} \end{array}\right]\left[\begin{array}{c} \boldsymbol{u}_{i} \\ \boldsymbol{v}_{i} \end{array} \right] } & =\left[\begin{array}{c} \boldsymbol{A} \boldsymbol{v}_{i} \\ \boldsymbol{A}^{*} \boldsymbol{u}_{i} \end{array}\right]=\left[\begin{array}{l} \alpha_{i} \boldsymbol{u}_{i} \\ \alpha_{i} \boldsymbol{v}_{i} \end{array}\right]= \alpha_{i}\left[\begin{array}{l} \boldsymbol{u}_{i} \\ \boldsymbol{v}_{i} \end{array}\right], \quad i=1, \ldots, r, \\ {\left[\begin{array}{cc} \boldsymbol{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \boldsymbol{0} \end{array}\right]\left[\begin{array}{c} \boldsymbol{u}_{i} \\ -\boldsymbol{v}_{i} \end{array}\right] } & =\left[\begin{array}{c} -\boldsymbol{A} \boldsymbol{v}_{i} \\ \boldsymbol{A}^{*} \boldsymbol{u}_{i} \end{array}\right]=\left[\begin{array}{c} -\alpha_{i} \boldsymbol{u}_{i} \\ \alpha_{i} \boldsymbol{v}_{i} \end{array}\right]=- \alpha_{i}\left[\begin{array}{c} \boldsymbol{u}_{i} \\ -\boldsymbol{v}_{i} \end{array}\right], \quad i=1, \ldots, r, \\ {\left[\begin{array}{cc} \boldsymbol{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \boldsymbol{0} \end{array}\right]\left[\begin{array}{c} \boldsymbol{u}_{i} \\ \boldsymbol{0} \end{array}\right] } & =\left[\begin{array}{c} \boldsymbol{0} \\ \boldsymbol{A}^{*} \boldsymbol{u}_{i} \end{array}\right]=\left[\begin{array}{l} \boldsymbol{0} \\ \boldsymbol{0} \end{array} \right]=0\left[\begin{array}{c} \boldsymbol{u}_{i} \\ \boldsymbol{0} \end{array}\right], \quad i=r+1, \ldots, m, \\ {\left[\begin{array}{cc} \boldsymbol{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \boldsymbol{0} \end{array}\right]\left[\begin{array}{c} \boldsymbol{0} \\ \boldsymbol{v}_{i} \end{array}\right] } & =\left[\begin{array}{c} \boldsymbol{A} \boldsymbol{v}_{i} \\ \boldsymbol{0} \end{array}\right]=\left[\begin{array}{l} \boldsymbol{0} \\ \boldsymbol{0} \end{array}\right]=0\left[\begin{array}{c} \boldsymbol{0} \\ \boldsymbol{v}_{i} \end{array}\right], \quad i=r+1, \ldots, n. \end{aligned}$
lyche-numerical-linear-algebra_EQ0371	151	■ 0.194	\boldsymbol{J}:=\left[\begin{array}{ccccccc} 3 & 1 & & & & & \\ & & & & & & \\ 0 & 3 & & & & & \\ & & & & & & \\ & & 2 & 1 & & & \\ & & & & & & \\ & & 0 & 2 & & & \\ & & & & & & \\ & & & & 2 & & \\ & & & & & & \\ & & & & 0 & 1 & 0 \\ & & & & & & \\ & & & & 0 & 2 & 1 \\ & & & & & & \\ & & & & 0 & 2 & \\ & & & & & & \end{array}\right]	$\boldsymbol{J}:=\left[\begin{array}{ccccccc} 3 & 1 & & & & & \\ & & & & & & \\ 0 & 3 & & & & & \\ & & & & & & \\ & & 2 & 1 & & & \\ & & & & & & \\ & & 0 & 2 & & & \\ & & & & & & \\ & & & & 2 & & \\ & & & & & & \\ & & & & 0 & 1 & 0 \\ & & & & & & \\ & & & & 0 & 2 & 1 \\ & & & & & & \\ & & & & 0 & 2 & \\ & & & & & & \end{array}\right]$	

Identifier	Page	Conf.	LaTeX source	Rendered	Image
lyche-numerical-linear-algebra_EQ0492 (8.20)	193	■ 0.232	`\begin{aligned} & \\|\boldsymbol{A}\\|_{2}=\sigma_{1} \text { and }\left\\|\boldsymbol{A}^{-1}\right\\|_{2}=\frac{1}{\sigma_{n}} \\ & \\|\boldsymbol{A}\\|_{2}=\lambda_{1} \text { and }\left\\|\boldsymbol{A}^{-1}\right\\|_{2}= \frac{1}{\lambda_{n}}, \text { if } \boldsymbol{A} \text { is positive definite, } \\ & \\|\boldsymbol{A} \\|_{2}=\left|\lambda_{1}\right| \text { and }\left \\|\boldsymbol{A}^{-1}\right\\|_{2}=\frac{1}{\left| \lambda_{n}\right|}, \text { if } \boldsymbol{A} \text { is normal. } \end{aligned}`	$\|\boldsymbol{A}\|_{2}=\sigma_{1} \text { and }\left\|\boldsymbol{A}^{-1}\right\|_{2}=\frac{1}{\sigma_{n}}$ $\|\boldsymbol{A}\|_{2}=\lambda_{1} \text { and }\left\|\boldsymbol{A}^{-1}\right\|_{2}= \frac{1}{\lambda_{n}}, \text { if } \boldsymbol{A} \text { is positive definite,}$ $\|\boldsymbol{A} \|_{2}=\left\|\lambda_{1}\right\| \text { and }\left \|\boldsymbol{A}^{-1}\right\|_{2}=\frac{1}{\left\| \lambda_{n}\right\|}, \text { if } \boldsymbol{A} \text { is normal.}$	$\|\boldsymbol{A}\|_{2}=\sigma_{1} \text { and }\|\boldsymbol{A}^{-1}\|_{2}=\frac{1}{\sigma_{n}},$ $\|\boldsymbol{A}\|_{2}=\lambda_{1} \text { and }\|\boldsymbol{A}^{-1}\|_{2}=\frac{1}{\lambda_{n}}, \quad \text{if } \boldsymbol{A} \text{ is positive definite,}$ $\|\boldsymbol{A}\|_{2}=\left\|\lambda_{1}\right\| \text { and }\|\boldsymbol{A}^{-1}\|_{2}=\frac{1}{\left\| \lambda_{n}\right\|}, \text{ if } \boldsymbol{A} \text{ is normal.}$
lyche-numerical-linear-algebra_EQ0010	24	■ 0.244	`\begin{gathered} \operatorname{diag}\left(d_{i}\right)= \operatorname{diag}\left(d_{1}, \ldots, d_{n}\right):= \left[\begin{array}{cccc} d_{1} & 0 & \cdots & 0 \\ 0 & d_{2} & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & d_{n} \end{array}\right]= \left[\begin{array}{lll} d_{1} & & \\ & \ddots & \\ & & d_{n} \end{array}\right], \\ \boldsymbol{B}= \operatorname{tridiag}\left(a_{i}, d_{i}, c_{i}\right)= \operatorname{tridiag}(\boldsymbol{a}, \boldsymbol{d}, \boldsymbol{c}):=\left[\begin{array}{cccc} d_{1} & c_{1} & & \\ a_{1} & d_{2} & c_{2} & \\ & \ddots & \ddots & \ddots \\ & & a_{n-2} & d_{n-1} \\ & & & a_{n-1} \\ & & & d_{n} \end{array}\right] . \end{gathered}`	$\operatorname{diag}\left(d_{i}\right)=\operatorname{diag}\left(d_{1}, \ldots, d_{n}\right):=\left[\begin{array}{cccc} d_{1} & 0 & \cdots & 0 \\ 0 & d_{2} & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & d_{n} \end{array}\right]=\left[\begin{array}{lll} d_{1} & & \\ & \ddots & \\ & & d_{n} \end{array}\right],$ $\boldsymbol{B}=\operatorname{tridiag}\left(a_{i}, d_{i}, c_{i}\right)=\operatorname{tridiag}(\boldsymbol{a}, \boldsymbol{d}, \boldsymbol{c}):=\left[\begin{array}{cccc} d_{1} & c_{1} & & \\ a_{1} & d_{2} & c_{2} & \\ & \ddots & \ddots & \ddots \\ & & a_{n-2} & d_{n-1} \\ & & & a_{n-1} \\ & & & d_{n} \end{array}\right] .$	$\operatorname{diag}(d_i)=\operatorname{diag}(d_1,\ldots,d_n):=\begin{bmatrix} d_1 & 0 & \cdots & 0 \\ 0 & d_2 & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & d_n \end{bmatrix}=\begin{bmatrix} d_1 & & \\ & \ddots & \\ & & d_n \end{bmatrix},$ $\boldsymbol{B}=\operatorname{tridiag}(a_i,d_i,c_i)=\operatorname{tridiag}(\boldsymbol{a},\boldsymbol{d},\boldsymbol{c}):=\begin{bmatrix} d_1 & c_1 & & & \\ a_1 & d_2 & c_2 & & \\ & \ddots & \ddots & \ddots & \\ & & a_{n-2} & d_{n-1} & c_{n-1} \\ & & & a_{n-1} & d_n \end{bmatrix}.$
lyche-numerical-linear-algebra_EQ0924 (13.53)	314	■ 0.288	`\begin{array}{rlr} \left(L_{h} v\right)_{j, k} & := \frac{(d v)_{j, k}}{h^{2}}=f_{j, k}, & (j, k) \in I_{m}, \\ v_{j, k} & =0, & (j, k) \in \partial I_{m}, \end{array}`	$\begin{array}{rlr} \left(L_{h} v\right)_{j, k} & := \frac{(d v)_{j, k}}{h^{2}}=f_{j, k}, & (j, k) \in I_{m}, \\ v_{j, k} & =0, & (j, k) \in \partial I_{m}, \end{array}$	$\begin{array}{rlr} (L_h v)_{j,k} & := \dfrac{(dv)_{j,k}}{h^2}=f_{j,k}, & (j,k)\in I_m, \\ v_{j,k} & =0, & (j,k)\in \partial I_m, \end{array}$
lyche-numerical-linear-algebra_EQ0369 (6.7)	150	■ 0.298	`\boldsymbol{J}:=\operatorname{diag}\left(\boldsymbol{U}_{1}, \boldsymbol{U}_{2}\right)=\left[\begin{array}{ccccccc} 2 & 1 & 0 & & & & \\ 0 & 2 & 1 & & & & \\ 0 & 0 & 2 & & 1 & & \\ & & 0 & 1 & & & \\ & & 0 & 2 & & & \\ & & & & & 0 & \\ & & & & & 0 & 1 \end{array} \right] \in \mathbb{R}^{8 \times 8} .`	$\boldsymbol{J}:=\operatorname{diag}\left(\boldsymbol{U}_{1}, \boldsymbol{U}_{2}\right)=\left[\begin{array}{ccccccc} 2 & 1 & 0 & & & & \\ 0 & 2 & 1 & & & & \\ 0 & 0 & 2 & & 1 & & \\ & & 0 & 1 & & & \\ & & 0 & 2 & & & \\ & & & & & 0 & \\ & & & & & 0 & 1 \end{array}\right] \in \mathbb{R}^{8 \times 8}.$	$\boldsymbol{J}:=\operatorname{diag}(\boldsymbol{U}_1,\boldsymbol{U}_2)=\begin{bmatrix} 2 & 1 & 0 & & & & & \\ 0 & 2 & 1 & & & & & \\ 0 & 0 & 2 & & & & & \\ & & & 2 & 1 & & & \\ & & & 0 & 2 & & & \\ & & & & & 2 & & \\ & & & & & & 3 & 1 \\ & & & & & & 0 & 3 \end{bmatrix} \in \mathbb{R}^{8\times 8}.$

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lyche-numerical-linear-algebra_EQ0375	152	■ 0.305	\begin{aligned} \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U}=\boldsymbol{W}^{*}\left(\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{V}\right) \boldsymbol{W} & = \left[\begin{array}{l|l} 1 & \mathbf{0}^{*} \\ \hline \mathbf{0} & \boldsymbol{W}_{1}^{*} \end{array}\right] \left[\begin{array}{l|l} \lambda_{1} & \boldsymbol{x}^{*} \\ \hline \mathbf{0} & \boldsymbol{M} \end{array} \right]\left[\begin{array}{l|l} 1 & \mathbf{0}^{*} \\ \hline \mathbf{0} & \boldsymbol{W}_{1} \end{array} \right] \\ & =\left[\begin{array}{l|l} \lambda_{1} & \boldsymbol{x}^{*} \boldsymbol{W}_{1} \\ \hline \mathbf{0} & \boldsymbol{W}_{1}^{*} \boldsymbol{M} \boldsymbol{W}_{1} \end{array}\right] \end{aligned}	$$\begin{aligned} \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U}=\boldsymbol{W}^{*}\left(\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{V}\right) \boldsymbol{W} & = \left[\begin{array}{l\|l} 1 & \mathbf{0}^{*} \\ \hline \mathbf{0} & \boldsymbol{W}_{1}^{*} \end{array}\right] \left[\begin{array}{l\|l} \lambda_{1} & \boldsymbol{x}^{*} \\ \hline \mathbf{0} & \boldsymbol{M} \end{array} \right]\left[\begin{array}{l\|l} 1 & \mathbf{0}^{*} \\ \hline \mathbf{0} & \boldsymbol{W}_{1} \end{array} \right] \\ & =\left[\begin{array}{l\|l} \lambda_{1} & \boldsymbol{x}^{*} \boldsymbol{W}_{1} \\ \hline \mathbf{0} & \boldsymbol{W}_{1}^{*} \boldsymbol{M} \boldsymbol{W}_{1} \end{array}\right] \end{aligned}$$	$$\begin{aligned} \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U}=\boldsymbol{W}^{*}\left(\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{V}\right) \boldsymbol{W} & = \left[\begin{array}{l\|l} 1 & \mathbf{0}^{*} \\ \hline \mathbf{0} & \boldsymbol{W}_{1}^{*} \end{array}\right] \left[\begin{array}{l\|l} \lambda_{1} & \boldsymbol{x}^{*} \\ \hline \mathbf{0} & \boldsymbol{M} \end{array} \right]\left[\begin{array}{l\|l} 1 & \mathbf{0}^{*} \\ \hline \mathbf{0} & \boldsymbol{W}_{1} \end{array} \right] \\ & =\left[\begin{array}{l\|l} \lambda_{1} & \boldsymbol{x}^{*} \boldsymbol{W}_{1} \\ \hline \mathbf{0} & \boldsymbol{W}_{1}^{*} \boldsymbol{M} \boldsymbol{W}_{1} \end{array}\right] \end{aligned}$$
lyche-numerical-linear-algebra_EQ0366 (6.4)	149	■ 0.315	\boldsymbol{J}_{m}(\lambda):=\left[\begin{array}{cccccc} \lambda & 1 & 0 & \cdots & 0 & 0 \\ 0 & \lambda & 1 & \cdots & 0 & 0 \\ 0 & 0 & \lambda & \cdots & 0 & 0 \\ \vdots & & & & & \vdots \\ 0 & 0 & 0 & \cdots & \lambda & \lambda \\ 0 & 0 & 0 & \cdots & 0 & \lambda \end{array}\right]=\lambda \boldsymbol{I}_{m}+\boldsymbol{E}_{m}, \quad \boldsymbol{E}_{m}:=\left[\begin{array}{cccccc} 0 & 1 & 0 & \cdots & 0 & 0 \\ 0 & 0 & 1 & \cdots & 0 & 0 \\ 0 & 0 & 0 & \cdots & 0 & 0 \\ \vdots & & & & & \vdots \\ 0 & 0 & 0 & \cdots & 0 & 1 \\ 0 & 0 & 0 & \cdots & 0 & 0 \end{array}\right] .	$$\boldsymbol{J}_{m}(\lambda):=\left[\begin{array}{cccccc} \lambda & 1 & 0 & \cdots & 0 & 0 \\ 0 & \lambda & 1 & \cdots & 0 & 0 \\ 0 & 0 & \lambda & \cdots & 0 & 0 \\ \vdots & & & & & \vdots \\ 0 & 0 & 0 & \cdots & \lambda & \lambda \\ 0 & 0 & 0 & \cdots & 0 & \lambda \end{array}\right]=\lambda \boldsymbol{I}_{m}+\boldsymbol{E}_{m}, \quad \boldsymbol{E}_{m}:=\left[\begin{array}{cccccc} 0 & 1 & 0 & \cdots & 0 & 0 \\ 0 & 0 & 1 & \cdots & 0 & 0 \\ 0 & 0 & 0 & \cdots & 0 & 0 \\ \vdots & & & & & \vdots \\ 0 & 0 & 0 & \cdots & 0 & 1 \\ 0 & 0 & 0 & \cdots & 0 & 0 \end{array}\right] .$$	$$\boldsymbol{J}_{m}(\lambda):=\left[\begin{array}{cccccc} \lambda & 1 & 0 & \cdots & 0 & 0 \\ 0 & \lambda & 1 & \cdots & 0 & 0 \\ 0 & 0 & \lambda & \cdots & 0 & 0 \\ \vdots & & & & & \vdots \\ 0 & 0 & 0 & \cdots & \lambda & 1 \\ 0 & 0 & 0 & \cdots & 0 & \lambda \end{array}\right]=\lambda \boldsymbol{I}_{m}+\boldsymbol{E}_{m}, \quad \boldsymbol{E}_{m}:=\left[\begin{array}{cccccc} 0 & 1 & 0 & \cdots & 0 & 0 \\ 0 & 0 & 1 & \cdots & 0 & 0 \\ 0 & 0 & 0 & \cdots & 0 & 0 \\ \vdots & & & & & \vdots \\ 0 & 0 & 0 & \cdots & 0 & 1 \\ 0 & 0 & 0 & \cdots & 0 & 0 \end{array}\right] .$$
lyche-numerical-linear-algebra_EQ0579	215	■ 0.322	\begin{aligned} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{x} & =\left[\begin{array}{ccc} 1 & \cdots & 1 \\ t_{1} & \cdots & t_{m} \end{array}\right]\left[\begin{array}{c} 1 \\ \vdots \\ 1 \\ 1 \\ m \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array} \right]=\left[\begin{array}{cc} m & \sum t_{k} \\ \sum t_{k} & \sum t_{k}^{2} \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right], \\ & =\left[\begin{array}{ccc} 1 & \cdots & 1 \\ t_{1} & \cdots & t_{m} \end{array}\right]\left[\begin{array}{c} y_{1} \\ \vdots \\ y_{m} \end{array}\right]=\left[\begin{array}{c} \sum y_{k} \\ \sum t_{k} y_{k} \end{array}\right]=\boldsymbol{A}^{*} \boldsymbol{b}, \end{aligned}	$$\begin{aligned} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{x} & =\left[\begin{array}{ccc} 1 & \cdots & 1 \\ t_{1} & \cdots & t_{m} \end{array}\right]\left[\begin{array}{c} 1 \\ \vdots \\ 1 \\ 1 \\ m \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array} \right]=\left[\begin{array}{cc} m & \sum t_{k} \\ \sum t_{k} & \sum t_{k}^{2} \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right], \\ & =\left[\begin{array}{ccc} 1 & \cdots & 1 \\ t_{1} & \cdots & t_{m} \end{array}\right]\left[\begin{array}{c} y_{1} \\ \vdots \\ y_{m} \end{array}\right]=\left[\begin{array}{c} \sum y_{k} \\ \sum t_{k} y_{k} \end{array}\right]=\boldsymbol{A}^{*} \boldsymbol{b}, \end{aligned}$$	$$\begin{aligned} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{x} & =\left[\begin{array}{ccc} 1 & \cdots & 1 \\ t_{1} & \cdots & t_{m} \end{array}\right]\left[\begin{array}{c} 1 \ t_{1} \\ \vdots \\ 1 \ t_{m} \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array} \right]=\left[\begin{array}{cc} m & \sum t_{k} \\ \sum t_{k} & \sum t_{k}^{2} \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right], \\ & =\left[\begin{array}{ccc} 1 & \cdots & 1 \\ t_{1} & \cdots & t_{m} \end{array}\right]\left[\begin{array}{c} y_{1} \\ \vdots \\ y_{m} \end{array}\right]=\left[\begin{array}{c} \sum y_{k} \\ \sum t_{k} y_{k} \end{array}\right]=\boldsymbol{A}^{*} \boldsymbol{b}, \end{aligned}$$

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lyche-numerical-linear-algebra_EQ0335 (5.19)	135	0.329	`\left[\begin{array}{l} \boldsymbol{B}(i,:) \\ \boldsymbol{B}(j,:) \end{array}\right]=\left[\begin{array}{rc} c & s \\ -s c & \end{array}\right] \left[\begin{array}{l} \boldsymbol{A}(i,:) \\ \boldsymbol{A}(j,:) \end{array}\right],[\boldsymbol{C}(:, i) \boldsymbol{C}(:, j)]=[\boldsymbol{A}(:, i) \boldsymbol{A}(:, j)]\left[\begin{array}{rc} c & s \\ -s & c \end{array}\right] .`	$\left[\begin{array}{l} \boldsymbol{B}(i,:) \\ \boldsymbol{B}(j,:) \end{array}\right]=\left[\begin{array}{rc} c & s \\ -sc & \end{array}\right] \left[\begin{array}{l} \boldsymbol{A}(i,:) \\ \boldsymbol{A}(j,:) \end{array}\right],[\boldsymbol{C}(:, i) \boldsymbol{C}(:, j)]=[\boldsymbol{A}(:, i) \boldsymbol{A}(:, j)]\left[\begin{array}{rc} c & s \\ -s & c \end{array}\right] .$	$\left[\begin{array}{l} \boldsymbol{B}(i,:) \\ \boldsymbol{B}(j,:) \end{array}\right]=\left[\begin{array}{rc} c & s \\ -s & c \end{array}\right] \left[\begin{array}{l} \boldsymbol{A}(i,:) \\ \boldsymbol{A}(j,:) \end{array}\right],[\boldsymbol{C}(:, i) \boldsymbol{C}(:, j)]=[\boldsymbol{A}(:, i) \boldsymbol{A}(:, j)]\left[\begin{array}{rc} c & s \\ -s & c \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0917	312	0.371	`\frac{\left|\boldsymbol{x}-\boldsymbol{x}_{k}\right|_{ \boldsymbol{A}}}{\left|\boldsymbol{x}-\boldsymbol{x}_{0} \right|_{\boldsymbol{A}}} \leq 2\left(\frac{\sqrt{ \kappa}-1}{\sqrt{\kappa}+1}\right)^{k} \quad \text { for } \quad k \geq 0`	$\frac{\left\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\|_{\boldsymbol{A}}}{\left\|\boldsymbol{x}-\boldsymbol{x}_{0}\right\|_{\boldsymbol{A}}} \leq 2\left(\frac{\sqrt{\kappa}-1}{\sqrt{\kappa}+1}\right)^{k} \quad \text { for } \quad k \geq 0$	$\frac{\left\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\|_{\boldsymbol{A}}}{\left\|\boldsymbol{x}-\boldsymbol{x}_{0}\right\|_{\boldsymbol{A}}} \leq 2\left(\frac{\sqrt{\kappa}-1}{\sqrt{\kappa}+1}\right)^{k}, \quad \text { for } \quad k \geq 0,$
lyche-numerical-linear-algebra_EQ0547	207	0.373	`c_{i, k+1}= \begin{cases}0 & \text { if } \sigma_{i}= \lambda_{k+1}, \\ c_{i, k}\left(1-\frac{\sigma_{i}}{ \lambda_{k+1}}\right) & \text { otherwise } .\end{cases}`	$c_{i, k+1}=\begin{cases}0 & \text { if } \sigma_{i}=\lambda_{k+1}, \\ c_{i, k}\left(1-\frac{\sigma_{i}}{\lambda_{k+1}}\right) & \text { otherwise } .\end{cases}$	$c_{i, k+1}=\begin{cases}0 & \text { if } \sigma_{i}=\lambda_{k+1}, \\ c_{i, k}\left(1-\frac{\sigma_{i}}{\lambda_{k+1}}\right) & \text { otherwise. }\end{cases}$
lyche-numerical-linear-algebra_EQ0855	296	0.386	`\begin{array}{ll} \boldsymbol{t}_{0}=\left[\begin{array}{c} 3 \\ -3 / 2 \end{array}\right], \quad \alpha_{0}=1 / 2, \quad \boldsymbol{x}_{1}=\left[\begin{array}{l} -1 / 4 \\ -1 / 2 \end{array}\right], \quad \boldsymbol{r}_{1}=\left[\begin{array}{c} 0 \\ 3 / 4 \end{array}\right], \quad \beta_{0}=1 / 4, \\ \boldsymbol{p}_{1}=\left[\begin{array}{l} 3 / 8 \\ 3 / 4 \end{array}\right], \quad \boldsymbol{t}_{1}=\left[\begin{array}{c} 0 \\ 9 / 8 \end{array}\right], \quad \alpha_{1}=2 / 3, \quad \boldsymbol{x}_{2}=\mathbf{0}, \quad \boldsymbol{r}_{2}=\mathbf{0} . \end{array}`	$\begin{array}{ll} \boldsymbol{t}_{0}=\left[\begin{array}{c} 3 \\ -3 / 2 \end{array}\right], \quad \alpha_{0}=1 / 2, \quad \boldsymbol{x}_{1}=\left[\begin{array}{l} -1 / 4 \\ -1 / 2 \end{array}\right], \quad \boldsymbol{r}_{1}=\left[\begin{array}{c} 0 \\ 3 / 4 \end{array}\right], \quad \beta_{0}=1 / 4, \\ \boldsymbol{p}_{1}=\left[\begin{array}{l} 3 / 8 \\ 3 / 4 \end{array}\right], \quad \boldsymbol{t}_{1}=\left[\begin{array}{c} 0 \\ 9 / 8 \end{array}\right], \quad \alpha_{1}=2 / 3, \quad \boldsymbol{x}_{2}=\mathbf{0}, \quad \boldsymbol{r}_{2}=\mathbf{0} . \end{array}$	$\begin{array}{ll} \boldsymbol{t}_{0}=\left[\begin{array}{c} 3 \\ -3 / 2 \end{array}\right], \quad \alpha_{0}=1 / 2, \quad \boldsymbol{x}_{1}=\left[\begin{array}{l} -1 / 4 \\ -1 / 2 \end{array}\right], \quad \boldsymbol{r}_{1}=\left[\begin{array}{c} 0 \\ 3 / 4 \end{array}\right], \quad \beta_{0}=1 / 4, \\ \boldsymbol{p}_{1}=\left[\begin{array}{l} 3 / 8 \\ 3 / 4 \end{array}\right], \quad \boldsymbol{t}_{1}=\left[\begin{array}{c} 0 \\ 9 / 8 \end{array}\right], \quad \alpha_{1}=2 / 3, \quad \boldsymbol{x}_{2}=\mathbf{0}, \quad \boldsymbol{r}_{2}=\mathbf{0} . \end{array}$
lyche-numerical-linear-algebra_EQ0670 (10.10)	241	0.390	`\begin{aligned} a_{i i} & =2 d, i=1, \ldots, n, \\ a_{i, i+1}=a_{i+1, i} & =a, \quad i=1, \ldots, n-1, \quad i \neq m, 2 m, \ldots,(m-1) m, \\ a_{i, i+m}=a_{i+m, i} & =a, \quad i=1, \ldots, n-m, \\ a_{i j} & =0, \text { otherwise } \end{aligned}`	$\begin{aligned} a_{i i} & =2 d, i=1, \ldots, n, \\ a_{i, i+1}=a_{i+1, i} & =a, \quad i=1, \ldots, n-1, \quad i \neq m, 2 m, \ldots,(m-1) m, \\ a_{i, i+m}=a_{i+m, i} & =a, \quad i=1, \ldots, n-m, \\ a_{i j} & =0, \text { otherwise } \end{aligned}$	$\begin{aligned} a_{i i} & =2 d, i=1, \ldots, n, \\ a_{i, i+1}=a_{i+1, i} & =a, \quad i=1, \ldots, n-1, \quad i \neq m, 2 m, \ldots,(m-1) m, \\ a_{i, i+m}=a_{i+m, i} & =a, \quad i=1, \ldots, n-m, \\ a_{i j} & =0, \text { otherwise, } \end{aligned}$
lyche-numerical-linear-algebra_EQ0763 (12.14)	271	0.402	`\boldsymbol{G}_{\omega}=\left[\begin{array}{ll} l & 0 \ \ 0 & 1 \end{array}\right]-\left[\begin{array}{cc} \omega / 2 & 0 \\ \omega^{2} / 4 & \omega / 2 \end{array}\right] \left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array} \right]=\left[\begin{array}{cc} 1-\omega & \omega / 2 \\ \omega(1-\omega) / 2 & 1-\omega+\omega^{2} / 4 \end{array}\right] .`	$\boldsymbol{G}_{\omega}=\left[\begin{array}{ll} l & 0 \ \ 0 & 1 \end{array}\right]-\left[\begin{array}{cc} \omega / 2 & 0 \\ \omega^{2} / 4 & \omega / 2 \end{array}\right] \left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right]=\left[\begin{array}{cc} 1-\omega & \omega / 2 \\ \omega(1-\omega) / 2 & 1-\omega+\omega^{2} / 4 \end{array}\right] .$	$\boldsymbol{G}_{\omega}=\left[\begin{array}{ll} l & 0 \ \ 0 & 1 \end{array}\right]-\left[\begin{array}{cc} \omega / 2 & 0 \\ \omega^{2} / 4 & \omega / 2 \end{array}\right] \left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right]=\left[\begin{array}{cc} 1-\omega & \omega / 2 \\ \omega(1-\omega) / 2 & 1-\omega+\omega^{2} / 4 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0498	194	0.420	`\begin{aligned} & x_{1}+\left(1-10^{-16}\right) x_{2}=20 \\ & x_{1}+\left(1-10^{-15}\right. \end{aligned}`	$\begin{aligned} & x_{1}+\left(1-10^{-16}\right) x_{2}=20 \\ & x_{1}+\left(1-10^{-15}\right. \end{aligned}$	$\begin{aligned} & x_{1}+ \quad x_{2}=20 \\ & x_{1}+\left(1-10^{-16}\right) x_{2}=20-10^{-15} \end{aligned}$

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lyche-numerical-linear-algebra_EQ0262	107	0.421	`\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}=z^{*} \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U} \boldsymbol{z}=z^{*} \operatorname{diag}\left( \lambda_{1}, \ldots, \lambda_{n}\right) \boldsymbol{z}= \sum_{j=1}^{n} \lambda_{j}\left|z_{j}\right|^{2} \geq 0 .`	$\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}=z^{*} \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U} \boldsymbol{z}=z^{*} \operatorname{diag}\left(\lambda_{1}, \ldots, \lambda_{n}\right) \boldsymbol{z}=\sum_{j=1}^{n} \lambda_{j}\left\|z_{j}\right\|^{2} \geq 0 .$	$\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}=z^{*} \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U} \boldsymbol{z}=z^{*} \operatorname{diag}\left(\lambda_{1}, \ldots, \lambda_{n}\right) \boldsymbol{z}=\sum_{j=1}^{n} \lambda_{j}\left\|z_{j}\right\|^{2} \geq 0 .$
lyche-numerical-linear-algebra_EQ0404	161	0.448	`\left[\begin{array}{llllllll} 0 & 2 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 2 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{array}\right] \in \mathbb{R}^{8,8} ?`	$\left[\begin{array}{llllllll} 0 & 2 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 2 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{array}\right] \in \mathbb{R}^{8,8} ?$	$\left[\begin{array}{llllllll} 2 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 2 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 2 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 2 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 3 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 3 \end{array}\right] \in \mathbb{R}^{8,8} ?$
lyche-numerical-linear-algebra_EQ0914 (13.48)	311	0.453	`\begin{aligned} & \boldsymbol{y}_{k+1}= \boldsymbol{y}_{k}+\alpha_{k} \boldsymbol{q}_{k}, \quad \alpha_{k}=z_{k}^{T} z_{k} / \boldsymbol{q}_{k}^{T}\left(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}\right) \boldsymbol{q}_{k}, \\ & \boldsymbol{z}_{k+1}=z_{k}- \alpha_{k}\left(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}\right) \boldsymbol{q}_{k}, \\ & \boldsymbol{q}_{k+1}=z_{k+1}+\beta_{k} \boldsymbol{q}_{k}, \quad \beta_{k}=z_{k+1}^{T} z_{k+1} / z_{k}^{T} z_{k} . \end{aligned}`	$\begin{aligned} & \boldsymbol{y}_{k+1}= \boldsymbol{y}_{k}+\alpha_{k} \boldsymbol{q}_{k}, \quad \alpha_{k}=z_{k}^{T} z_{k} / \boldsymbol{q}_{k}^{T}\left(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}\right) \boldsymbol{q}_{k}, \\ & \boldsymbol{z}_{k+1}=z_{k}- \alpha_{k}\left(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}\right) \boldsymbol{q}_{k}, \\ & \boldsymbol{q}_{k+1}=z_{k+1}+\beta_{k} \boldsymbol{q}_{k}, \quad \beta_{k}=z_{k+1}^{T} z_{k+1} / z_{k}^{T} z_{k} . \end{aligned}$	$\begin{aligned} & \boldsymbol{y}_{k+1}= \boldsymbol{y}_{k}+\alpha_{k} \boldsymbol{q}_{k}, \quad \alpha_{k}=z_{k}^{T} z_{k} / \boldsymbol{q}_{k}^{T}\left(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}\right) \boldsymbol{q}_{k}, \\ & \boldsymbol{z}_{k+1}=z_{k}- \alpha_{k}\left(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}\right) \boldsymbol{q}_{k}, \\ & \boldsymbol{q}_{k+1}=z_{k+1}+\beta_{k} \boldsymbol{q}_{k}, \quad \beta_{k}=z_{k+1}^{T} z_{k+1} / z_{k}^{T} z_{k} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0245	100	0.458	`\left[\begin{array}{ll} a & \bar{b} \\ b & d \end{array} \right]=\left[\begin{array}{ll} 1 & 0 \\ l_{1} & 1 \end{array}\right]\left[\begin{array}{cc} d_{1} & 0 \\ 0 & d_{2} \end{array}\right]\left[\begin{array}{cc} 1 & \overline{l_{1}} \\ 0 & 1 \end{array}\right]=\left[\begin{array}{cc} d_{1} & d_{1} \overline{l_{1}} \\ d_{1} l_{1} & d_{1}\left|l_{1}\right|^{2}+d_{2} \end{array} \right]`	$\left[\begin{array}{ll} a & \bar{b} \\ b & d \end{array} \right]=\left[\begin{array}{ll} 1 & 0 \\ l_{1} & 1 \end{array}\right]\left[\begin{array}{cc} d_{1} & 0 \\ 0 & d_{2} \end{array}\right]\left[\begin{array}{cc} 1 & \overline{l_{1}} \\ 0 & 1 \end{array}\right]=\left[\begin{array}{cc} d_{1} & d_{1} \overline{l_{1}} \\ d_{1} l_{1} & d_{1}\left\|l_{1}\right\|^{2}+d_{2} \end{array} \right]$	$\left[\begin{array}{ll} a & \bar{b} \\ b & d \end{array} \right]=\left[\begin{array}{ll} 1 & 0 \\ l_{1} & 1 \end{array}\right]\left[\begin{array}{cc} d_{1} & 0 \\ 0 & d_{2} \end{array}\right]\left[\begin{array}{cc} 1 & \overline{l_{1}} \\ 0 & 1 \end{array}\right]=\left[\begin{array}{cc} d_{1} & d_{1} \overline{l_{1}} \\ d_{1} l_{1} & d_{1}\left\|l_{1}\right\|^{2}+d_{2} \end{array} \right]$
lyche-numerical-linear-algebra_EQ0370	150	0.466	`\begin{aligned} & \boldsymbol{A} \boldsymbol{s}_{1}=2 \boldsymbol{s}_{1}, \quad \boldsymbol{A} \boldsymbol{s}_{2}=\boldsymbol{s}_{1}+2 \boldsymbol{s}_{2}, \quad \boldsymbol{A} \boldsymbol{s}_{3}=\boldsymbol{s}_{2}+2 \boldsymbol{s}_{3}, \\ & \boldsymbol{A} \boldsymbol{s}_{4}=2 \boldsymbol{s}_{4}, \quad \boldsymbol{A} \boldsymbol{s}_{5}=\boldsymbol{s}_{4}+2 \boldsymbol{s}_{5} \\ & \boldsymbol{A} \boldsymbol{s}_{6}=2 \boldsymbol{s}_{6}, \\ & \boldsymbol{A} \boldsymbol{s}_{7}=3 \boldsymbol{s}_{7}, \quad \boldsymbol{A} \boldsymbol{s}_{8}=\boldsymbol{s}_{7}+3 \boldsymbol{s}_{8} . \end{aligned}`	$\begin{aligned} & \boldsymbol{A} \boldsymbol{s}_{1}=2 \boldsymbol{s}_{1}, \quad \boldsymbol{A} \boldsymbol{s}_{2}=\boldsymbol{s}_{1}+2 \boldsymbol{s}_{2}, \quad \boldsymbol{A} \boldsymbol{s}_{3}=\boldsymbol{s}_{2}+2 \boldsymbol{s}_{3}, \\ & \boldsymbol{A} \boldsymbol{s}_{4}=2 \boldsymbol{s}_{4}, \quad \boldsymbol{A} \boldsymbol{s}_{5}=\boldsymbol{s}_{4}+2 \boldsymbol{s}_{5} \\ & \boldsymbol{A} \boldsymbol{s}_{6}=2 \boldsymbol{s}_{6}, \\ & \boldsymbol{A} \boldsymbol{s}_{7}=3 \boldsymbol{s}_{7}, \quad \boldsymbol{A} \boldsymbol{s}_{8}=\boldsymbol{s}_{7}+3 \boldsymbol{s}_{8} . \end{aligned}$	$\begin{aligned} & \boldsymbol{A} \boldsymbol{s}_{1}=2 \boldsymbol{s}_{1}, \quad \boldsymbol{A} \boldsymbol{s}_{2}=\boldsymbol{s}_{1}+2 \boldsymbol{s}_{2}, \quad \boldsymbol{A} \boldsymbol{s}_{3}=\boldsymbol{s}_{2}+2 \boldsymbol{s}_{3}, \\ & \boldsymbol{A} \boldsymbol{s}_{4}=2 \boldsymbol{s}_{4}, \quad \boldsymbol{A} \boldsymbol{s}_{5}=\boldsymbol{s}_{4}+2 \boldsymbol{s}_{5}, \\ & \boldsymbol{A} \boldsymbol{s}_{6}=2 \boldsymbol{s}_{6}, \\ & \boldsymbol{A} \boldsymbol{s}_{7}=3 \boldsymbol{s}_{7}, \quad \boldsymbol{A} \boldsymbol{s}_{8}=\boldsymbol{s}_{7}+3 \boldsymbol{s}_{8} . \end{aligned}$

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lyche-numerical-linear-algebra_EQ0396	158	■ 0.467	\begin{aligned} \beta_{k} & \leq \max _{\substack{ \boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{B}}(\boldsymbol{x}) \leq \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{A}}(\boldsymbol{x})+\max _{\substack{\boldsymbol{x} \in S \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{E}}(\boldsymbol{x}) \\ & \leq \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{A}}(\boldsymbol{x})+\max _{\substack{ \boldsymbol{x} \in \mathbb{C}^{n} \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{E}}(\boldsymbol{x})= \alpha_{k}+\varepsilon_{1}, \end{aligned}	$\begin{aligned} \beta_{k} & \leq \max _{\substack{ \boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{B}}(\boldsymbol{x}) \leq \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{A}}(\boldsymbol{x})+\max _{\substack{\boldsymbol{x} \in S \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{E}}(\boldsymbol{x}) \\ & \leq \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{A}}(\boldsymbol{x})+\max _{\substack{ \boldsymbol{x} \in \mathbb{C}^{n} \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{E}}(\boldsymbol{x})= \alpha_{k}+\varepsilon_{1}, \end{aligned}$	$\begin{aligned} \beta_{k} & \leq \max _{\substack{ \boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{B}}(\boldsymbol{x}) \leq \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{A}}(\boldsymbol{x})+\max _{\substack{\boldsymbol{x} \in S \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{E}}(\boldsymbol{x}) \\ & \leq \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{A}}(\boldsymbol{x})+\max _{\substack{ \boldsymbol{x} \in \mathbb{C}^{n} \\ \boldsymbol{x} \neq \mathbf{0}}} R_{\boldsymbol{E}}(\boldsymbol{x})= \alpha_{k}+\varepsilon_{1}, \end{aligned}$
lyche-numerical-linear-algebra_EQ0308	125	■ 0.469	\boldsymbol{P} \boldsymbol{x}=\boldsymbol{x}-\frac{ \boldsymbol{v}^{*} \boldsymbol{x}}{\boldsymbol{v}^{*} \boldsymbol{v}} \boldsymbol{v} \stackrel{(5.13)}{=} \boldsymbol{x}-\frac{1}{2} \boldsymbol{v}=\frac{1}{2}(\boldsymbol{x}+\boldsymbol{y}) .	$\boldsymbol{P} \boldsymbol{x}=\boldsymbol{x}-\frac{ \boldsymbol{v}^{*} \boldsymbol{x}}{\boldsymbol{v}^{*} \boldsymbol{v}} \boldsymbol{v} \stackrel{(5.13)}{=} \boldsymbol{x}-\frac{1}{2} \boldsymbol{v}=\frac{1}{2}(\boldsymbol{x}+\boldsymbol{y}) .$	$\boldsymbol{P} \boldsymbol{x}=\boldsymbol{x}-\frac{ \boldsymbol{v}^{*} \boldsymbol{x}}{\boldsymbol{v}^{*} \boldsymbol{v}} \boldsymbol{v} \stackrel{(5.13)}{=} \boldsymbol{x}-\frac{1}{2} \boldsymbol{v}=\frac{1}{2}(\boldsymbol{x}+\boldsymbol{y}) .$
lyche-numerical-linear-algebra_EQ0600 (O)	221	■ 0.474	\left[\begin{array}{lll} 2 & 2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 6 \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \\ x_{3} \end{array}\right]=\frac{1}{2}\left[\begin{array}{rrcr} 1 & 1 & 1 & 1 \\ 1 & 1 & -1 & -1 \\ -1 & 1 & -1 & 1 \end{array}\right] \times\left[\begin{array}{l} 1 \\ 1 \\ 1 \\ 1 \end{array}\right]= \left[\begin{array}{l} 2 \\ 0 \\ 0 \end{array}\right],	$\left[\begin{array}{lll} 2 & 2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 6 \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \\ x_{3} \end{array}\right]=\frac{1}{2}\left[\begin{array}{rrcr} 1 & 1 & 1 & 1 \\ 1 & 1 & -1 & -1 \\ -1 & 1 & -1 & 1 \end{array}\right] \times\left[\begin{array}{l} 1 \\ 1 \\ 1 \\ 1 \end{array}\right]= \left[\begin{array}{l} 2 \\ 0 \\ 0 \end{array}\right],$	$\left[\begin{array}{lll} 2 & 2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 6 \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \\ x_{3} \end{array}\right]=\frac{1}{2}\left[\begin{array}{rrcr} 1 & 1 & 1 & 1 \\ 1 & 1 & -1 & -1 \\ -1 & 1 & -1 & 1 \end{array}\right] \times\left[\begin{array}{l} 1 \\ 1 \\ 1 \\ 1 \end{array}\right]= \left[\begin{array}{l} 2 \\ 0 \\ 0 \end{array}\right],$
lyche-numerical-linear-algebra_EQ0028 (1.11)	31	■ 0.479	\\|x\\|_{2}:=\left(\sum_{j=1}^{n}\left|x_{j}\right|^{2} \right)^{1 / 2}=\sqrt{x^{*} x} .	$\\|x\\|_{2}:=\left(\sum_{j=1}^{n}\left\|x_{j}\right\|^{2} \right)^{1 / 2}=\sqrt{x^{*} x} .$	$\\|x\\|_{2}:=\left(\sum_{j=1}^{n}\left\|x_{j}\right\|^{2} \right)^{1 / 2}=\sqrt{x^{*} x} .$
lyche-numerical-linear-algebra_EQ0241 (3.33)	97	■ 0.492	\boldsymbol{B}:=\left[\begin{array}{cc} \left(1+\boldsymbol{u}_{1}^{T}\right. & \left. \boldsymbol{B}_{2,2} \boldsymbol{\ell}_{1} \right) / u_{1,1} \\ -\boldsymbol{u}_{2,2}^{T} & \boldsymbol{B}_{2,2} / u_{1,1} \\ & \boldsymbol{B}_{2,2} \end{array}\right] .	$\boldsymbol{B}:=\left[\begin{array}{cc} \left(1+\boldsymbol{u}_{1}^{T}\right. & \left. \boldsymbol{B}_{2,2} \boldsymbol{\ell}_{1} \right) / u_{1,1} \\ -\boldsymbol{u}_{2,2}^{T} & \boldsymbol{B}_{2,2} / u_{1,1} \\ & \boldsymbol{B}_{2,2} \end{array}\right] .$	$\boldsymbol{B}:=\left[\begin{array}{cc} \left(1+\boldsymbol{u}_{1}^{T}\right. & \left. \boldsymbol{B}_{2,2} \boldsymbol{\ell}_{1} \right) / u_{1,1} \\ -\boldsymbol{u}_{2,2}^{T} & \boldsymbol{B}_{2,2} / u_{1,1} \\ & \boldsymbol{B}_{2,2} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0757 (12.11)	270	■ 0.498	\boldsymbol{A}_{\boldsymbol{L}}:=\left[\begin{array}{ccc} 0 & & \\ -a_{2,1} & 0 & \\ \vdots & \ddots & \ddots \\ -a_{n, 1} & \cdots & -a_{n, n-1} \end{array} \right], \quad \boldsymbol{A}_{\boldsymbol{R}}:=\left[\begin{array}{ccc} 0 & -a_{1,2} & \cdots \\ \ddots & \ddots & \vdots \\ & 0 & -a_{n-1,n} \\ & & 0 \end{array} \right] .	$\boldsymbol{A}_{\boldsymbol{L}}:=\left[\begin{array}{ccc} 0 & & \\ -a_{2,1} & 0 & \\ \vdots & \ddots & \ddots \\ -a_{n, 1} & \cdots & -a_{n, n-1} \end{array} \right], \quad \boldsymbol{A}_{\boldsymbol{R}}:=\left[\begin{array}{ccc} 0 & -a_{1,2} & \cdots \\ \ddots & \ddots & \vdots \\ & 0 & -a_{n-1,n} \\ & & 0 \end{array} \right] .$	$\boldsymbol{A}_{\boldsymbol{L}}:=\left[\begin{array}{ccc} 0 & & \\ -a_{2,1} & 0 & \\ \vdots & \ddots & \ddots \\ -a_{n, 1} & \cdots & -a_{n, n-1} \end{array} \right], \quad \boldsymbol{A}_{\boldsymbol{R}}:=\left[\begin{array}{ccc} 0 & -a_{1,2} & \cdots \\ \ddots & \ddots & \vdots \\ & 0 & -a_{n-1,n} \\ & & 0 \end{array} \right] .$

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lyche-numerical-linear-algebra_EQ0138	64	0.503	`\left[\begin{array}{ll} A_{11} & A_{12} \\ A_{21} & A_{22} \end{array}\right]\left[\begin{array}{ll} B_{11} & B_{12} \\ B_{21} & B_{22} \end{array}\right]=\left[\begin{array}{ll} A_{11} B_{11}+A_{12} B_{21} & A_{11} B_{12}+A_{12} B_{22} \\ A_{21} B_{11}+A_{22} B_{21} & A_{21} B_{12}+A_{22} B_{22} \end{array}\right],`	$\left[\begin{array}{ll} A_{11} & A_{12} \\ A_{21} & A_{22} \end{array}\right]\left[\begin{array}{ll} B_{11} & B_{12} \\ B_{21} & B_{22} \end{array}\right]=\left[\begin{array}{ll} A_{11} B_{11}+A_{12} B_{21} & A_{11} B_{12}+A_{12} B_{22} \\ A_{21} B_{11}+A_{22} B_{21} & A_{21} B_{12}+A_{22} B_{22} \end{array}\right],$	$\left[\begin{array}{ll} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \boldsymbol{A}_{21} & \boldsymbol{A}_{22} \end{array}\right]\left[\begin{array}{ll} \boldsymbol{B}_{11} & \boldsymbol{B}_{12} \\ \boldsymbol{B}_{21} & \boldsymbol{B}_{22} \end{array}\right]=\left[\begin{array}{ll} \boldsymbol{A}_{11} \boldsymbol{B}_{11}+\boldsymbol{A}_{12} \boldsymbol{B}_{21} & \boldsymbol{A}_{11} \boldsymbol{B}_{12}+\boldsymbol{A}_{12} \boldsymbol{B}_{22} \\ \boldsymbol{A}_{21} \boldsymbol{B}_{11}+\boldsymbol{A}_{22} \boldsymbol{B}_{21} & \boldsymbol{A}_{21} \boldsymbol{B}_{12}+\boldsymbol{A}_{22} \boldsymbol{B}_{22} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0465 (8.1)	186	0.507	`\begin{aligned} \\|\boldsymbol{x}\\|_{p} & :=\left( \sum_{j=1}^{n}\left|x_{j}\right|^{p}\right)^{1 / p}, \\ \\|\boldsymbol{x}\\|_{\infty} & :=\max _{1 \leq j \leq n}\left|x_{j}\right| . \end{aligned}`	$\begin{aligned} \\|\boldsymbol{x}\\|_{p} & :=\left(\sum_{j=1}^{n}\left\|x_{j}\right\|^{p}\right)^{1 / p}, \\ \\|\boldsymbol{x}\\|_{\infty} & :=\max _{1 \leq j \leq n}\left\|x_{j}\right\| . \end{aligned}$	$\begin{aligned} \\|\boldsymbol{x}\\|_{p} & :=\left(\sum_{j=1}^{n}\left\|x_{j}\right\|^{p}\right)^{1 / p}, \\ \\|\boldsymbol{x}\\|_{\infty} & :=\max _{1 \leq j \leq n}\left\|x_{j}\right\| . \end{aligned}$
lyche-numerical-linear-algebra_EQ0486	191	0.508	`|x|_{p}:=\left(\sum_{j=1}^{n}\left|x_{j}\right|^{p} \right)^{1 / p}, p \geq 1, \quad|x|_{\infty}:=\max _{1 \leq j \leq n}\left|x_{j}\right| .`	$\\|x\\|_{p}:=\left(\sum_{j=1}^{n}\left\|x_{j}\right\|^{p} \right)^{1 / p}, p \geq 1, \quad\|x\|_{\infty}:=\max _{1 \leq j \leq n}\left\|x_{j}\right\| .$	$\\|\boldsymbol{x}\\|_{p}:=\left(\sum_{j=1}^{n}\left\|x_{j}\right\|^{p}\right)^{1 / p}, \ p \geq 1, \quad\|\boldsymbol{x}\|_{\infty}:=\max _{1 \leq j \leq n}\left\|x_{j}\right\|.$
lyche-numerical-linear-algebra_EQ0766	272	0.512	`x_{k+1}(2)=\frac{1}{2}\left(\frac{1}{2} x_{k}(2)+ \frac{1}{2}\right)+\frac{1}{2}=\frac{1}{4} x_{k}(2)+ \frac{3}{4} .`	$x_{k+1}(2)=\frac{1}{2}\left(\frac{1}{2} x_{k}(2)+\frac{1}{2}\right)+\frac{1}{2}=\frac{1}{4} x_{k}(2)+\frac{3}{4} .$	$\boldsymbol{x}_{k+1}(2)=\frac{1}{2}(\frac{1}{2} \boldsymbol{x}_{k}(2)+\frac{1}{2})+\frac{1}{2}=\frac{1}{4} \boldsymbol{x}_{k}(2)+\frac{3}{4}.$
lyche-numerical-linear-algebra_EQ1017	345	0.514	`z_{0}=\frac{1}{2}\left[\begin{array}{c} 1 \\ -1 \end{array}\right]+\frac{1}{2}\left[\begin{array}{l} 1 \\ 1 \end{array}\right]=c_{1} \boldsymbol{v}_{1}+c_{2} \boldsymbol{v}_{2} .`	$z_{0}=\frac{1}{2}\left[\begin{array}{c} 1 \\ -1 \end{array}\right]+\frac{1}{2}\left[\begin{array}{l} 1 \\ 1 \end{array}\right]=c_{1} \boldsymbol{v}_{1}+c_{2} \boldsymbol{v}_{2} .$	$\boldsymbol{z}_{0}=\frac{1}{2}\left[\begin{array}{c} 1 \\ -1 \end{array}\right]+\frac{1}{2}\left[\begin{array}{l} 1 \\ 1 \end{array}\right]=c_{1} \boldsymbol{v}_{1}+c_{2} \boldsymbol{v}_{2} .$
lyche-numerical-linear-algebra_EQ0798	280	0.516	`\begin{aligned} \left|\boldsymbol{x}_{k}- \boldsymbol{x}\right| & =\left|\boldsymbol{G}\left(\boldsymbol{x}_{k-1}-\boldsymbol{x}\right)\right| \leq|\boldsymbol{G}|\left|\boldsymbol{x}_{k-1}- \boldsymbol{x}\right| \\ & =|\boldsymbol{G}|\left|\boldsymbol{x}_{k-1}- \boldsymbol{x}_{k}+\boldsymbol{x}_{k}-\boldsymbol{x}\right| \leq|\boldsymbol{G}|\left(\left|\boldsymbol{x}_{k-1}- \boldsymbol{x}_{k}\right|+\left|\boldsymbol{x}_{k}- \boldsymbol{x}\right|\right) \end{aligned}`	$\begin{aligned} \left\|\boldsymbol{x}_{k}- \boldsymbol{x}\right\| & =\left\|\boldsymbol{G}\left(\boldsymbol{x}_{k-1}-\boldsymbol{x}\right)\right\| \leq\|\boldsymbol{G}\|\left\|\boldsymbol{x}_{k-1}- \boldsymbol{x}\right\| \\ & =\|\boldsymbol{G}\|\left\|\boldsymbol{x}_{k-1}- \boldsymbol{x}_{k}+\boldsymbol{x}_{k}-\boldsymbol{x}\right\| \leq\|\boldsymbol{G}\|\left(\left\|\boldsymbol{x}_{k-1}- \boldsymbol{x}_{k}\right\|+\left\|\boldsymbol{x}_{k}- \boldsymbol{x}\right\|\right) \end{aligned}$	$\begin{aligned} \left\|\boldsymbol{x}_{k}- \boldsymbol{x}\right\| & =\left\|\boldsymbol{G}\left(\boldsymbol{x}_{k-1}-\boldsymbol{x}\right)\right\| \leq\|\boldsymbol{G}\|\left\|\boldsymbol{x}_{k-1}- \boldsymbol{x}\right\| \\ & =\|\boldsymbol{G}\|\left\|\boldsymbol{x}_{k-1}- \boldsymbol{x}_{k}+\boldsymbol{x}_{k}-\boldsymbol{x}\right\| \leq\|\boldsymbol{G}\|\left(\left\|\boldsymbol{x}_{k-1}- \boldsymbol{x}_{k}\right\|+\left\|\boldsymbol{x}_{k}- \boldsymbol{x}\right\|\right). \end{aligned}$
lyche-numerical-linear-algebra_EQ0837 (13.3)	291	0.516	`Q(\boldsymbol{y}):=\frac{1}{2} \boldsymbol{y}^{T} \boldsymbol{A} \boldsymbol{y}-\boldsymbol{b}^{T} \boldsymbol{y}+c .`	$Q(\boldsymbol{y}):=\frac{1}{2} \boldsymbol{y}^{T} \boldsymbol{A} \boldsymbol{y}-\boldsymbol{b}^{T} \boldsymbol{y}+c .$	$Q(\boldsymbol{y}):=\frac{1}{2} \boldsymbol{y}^{T} \boldsymbol{A} \boldsymbol{y}-\boldsymbol{b}^{T} \boldsymbol{y}+c.$

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lyche-numerical-linear-algebra_EQ0854 (13.18)	296	0.521	\begin{aligned} \boldsymbol{t}_{k} & =\boldsymbol{A} \boldsymbol{p}_{k}, \\ \alpha_{k} & =\left(\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}\right) /\left(\boldsymbol{p}_{k}^{T} \boldsymbol{t}_{k} \right), \\ \boldsymbol{x}_{k+1} & =\boldsymbol{x}_{k}+ \alpha_{k} \boldsymbol{p}_{k}, \\ \boldsymbol{r}_{k+1} & =\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{t}_{k}, \\ \beta_{k} & =\left(\boldsymbol{r}_{k+1}^{T} \boldsymbol{r}_{k+1}\right) /\left(\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}\right), \\ \boldsymbol{p}_{k+1} & := \boldsymbol{r}_{k+1}+\beta_{k} \boldsymbol{p}_{k} . \end{aligned}	$\begin{aligned} \boldsymbol{t}_{k} & =\boldsymbol{A} \boldsymbol{p}_{k}, \\ \alpha_{k} & =\left(\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}\right) /\left(\boldsymbol{p}_{k}^{T} \boldsymbol{t}_{k} \right), \\ \boldsymbol{x}_{k+1} & =\boldsymbol{x}_{k}+ \alpha_{k} \boldsymbol{p}_{k}, \\ \boldsymbol{r}_{k+1} & =\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{t}_{k}, \\ \beta_{k} & =\left(\boldsymbol{r}_{k+1}^{T} \boldsymbol{r}_{k+1}\right) /\left(\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}\right), \\ \boldsymbol{p}_{k+1} & := \boldsymbol{r}_{k+1}+\beta_{k} \boldsymbol{p}_{k} . \end{aligned}$	$\begin{aligned} \boldsymbol{t}_{k} & =\boldsymbol{A} \boldsymbol{p}_{k}, \\ \alpha_{k} & =\left(\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}\right) /\left(\boldsymbol{p}_{k}^{T} \boldsymbol{t}_{k} \right), \\ \boldsymbol{x}_{k+1} & =\boldsymbol{x}_{k}+ \alpha_{k} \boldsymbol{p}_{k}, \\ \boldsymbol{r}_{k+1} & =\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{t}_{k}, \\ \beta_{k} & =\left(\boldsymbol{r}_{k+1}^{T} \boldsymbol{r}_{k+1}\right) /\left(\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}\right), \\ \boldsymbol{p}_{k+1} & := \boldsymbol{r}_{k+1}+\beta_{k} \boldsymbol{p}_{k} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0329	134	0.523	\boldsymbol{A}=\left[\begin{array}{llll} x & x & x & x \\ x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \end{array}\right] .	$\boldsymbol{A}=\left[\begin{array}{llll} x & x & x & x \\ x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \end{array}\right] .$	$\boldsymbol{A}=\left[\begin{array}{llll} x & x & x & x \\ x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0862	300	0.523	\kappa_{P}=\frac{\lambda_{\max }}{\lambda_{\min }}=\frac{ \cos ^{2}(\pi h / 2)}{\sin ^{2}(\pi h / 2)} \text { and } \sqrt{\kappa_{P}}=\frac{\cos (\pi h / 2)}{\sin (\pi h / 2)} \approx \frac{2}{\pi h} \approx \frac{2}{\pi} \sqrt{n} \text {. }	$\kappa_P=\frac{\lambda_{\max}}{\lambda_{\min}}=\frac{\cos^2(\pi h/2)}{\sin^2(\pi h/2)}$ and $\sqrt{\kappa_P}=\frac{\cos(\pi h/2)}{\sin(\pi h/2)} \approx \frac{2}{\pi h} \approx \frac{2}{\pi}\sqrt{n}.$	$\kappa_P=\frac{\lambda_{max}}{\lambda_{min}}=\frac{\cos^2(\pi h/2)}{\sin^2(\pi h/2)}$ and $\sqrt{\kappa_P}=\frac{\cos(\pi h/2)}{\sin(\pi h/2)} \approx \frac{2}{\pi h} \approx \frac{2}{\pi}\sqrt{n}.$
lyche-numerical-linear-algebra_EQ0504 (8.26)	197	0.531	K_{2}(\boldsymbol{A})= \begin{cases}\lambda_{1} / \lambda_{n}, & \text { if } \boldsymbol{A} \text { is positive definite, } \\ \left|\lambda_{1}\right| /\left| \lambda_{n}\right|, & \text { if } \boldsymbol{A} \text { is normal, } \\ \sigma_{1} / \sigma_{n}, & \text { in general. }\end{cases}	$K_2(\boldsymbol{A})=\begin{cases}\lambda_1/\lambda_n, & \text{if } \boldsymbol{A} \text{ is positive definite,} \\ \lvert\lambda_1\rvert/\lvert\lambda_n\rvert, & \text{if } \boldsymbol{A} \text{ is normal,} \\ \sigma_1/\sigma_n, & \text{in general.}\end{cases}$	$K_2(\boldsymbol{A})=\begin{cases}\lambda_1/\lambda_n, & \textit{if } \boldsymbol{A} \textit{ is positive definite,} \\ \lvert\lambda_1\rvert/\lvert\lambda_n\rvert, & \textit{if } \boldsymbol{A} \textit{ is normal,} \\ \sigma_1/\sigma_n, & \textit{in general.}\end{cases}$
lyche-numerical-linear-algebra_EQ0830 (12.46)	287	0.531	\boldsymbol{A}=\boldsymbol{M}-\boldsymbol{N}, \quad \boldsymbol{M}=(\boldsymbol{I}-\boldsymbol{L})\left(\boldsymbol{I}-\boldsymbol{L}^{T}\right), \quad \boldsymbol{N}=\boldsymbol{L} \boldsymbol{L}^{T} .	$\boldsymbol{A}=\boldsymbol{M}-\boldsymbol{N}, \quad \boldsymbol{M}=(\boldsymbol{I}-\boldsymbol{L})\left(\boldsymbol{I}-\boldsymbol{L}^{T}\right), \quad \boldsymbol{N}=\boldsymbol{L}\boldsymbol{L}^{T}.$	$\boldsymbol{A}=\boldsymbol{M}-\boldsymbol{N}, \quad \boldsymbol{M}=(\boldsymbol{I}-\boldsymbol{L})(\boldsymbol{I}-\boldsymbol{L}^{T}), \quad \boldsymbol{N}=\boldsymbol{L}\boldsymbol{L}^{T}.$
lyche-numerical-linear-algebra_EQ0098	54	0.532	\begin{aligned} & u_{1}=d_{1}, \quad l_{1}=a_{1} / u_{1}, \quad u_{2}=d_{2}-l_{1} c_{1}, \quad l_{2}=a_{2} / u_{2}, \quad u_{3}=d_{3}-l_{2} c_{2} \\ & z_{1}=b_{1}, \quad z_{2}=b_{2}-l_{1} z_{1}, \quad z_{3}=b_{3}-l_{2} z_{2} \\ & x_{3}=z_{3} / u_{3}, \quad x_{2}=\left(z_{2}-c_{2} x_{3}\right) / u_{2}, \quad x_{1}=\left(z_{1}-c_{1} x_{2}\right) / u_{1} \end{aligned}	$\begin{aligned} & u_1=d_1, \quad l_1=a_1/u_1, \quad u_2=d_2-l_1c_1, \quad l_2=a_2/u_2, \quad u_3=d_3-l_2c_2, \\ & z_1=b_1, \quad z_2=b_2-l_1z_1, \quad z_3=b_3-l_2z_2, \\ & x_3=z_3/u_3, \quad x_2=(z_2-c_2x_3)/u_2, \quad x_1=(z_1-c_1x_2)/u_1. \end{aligned}$	$\begin{aligned} & u_1=d_1, \quad l_1=a_1/u_1, \quad u_2=d_2-l_1c_1, \quad l_2=a_2/u_2, \quad u_3=d_3-l_2c_2, \\ & z_1=b_1, \quad z_2=b_2-l_1z_1, \quad z_3=b_3-l_2z_2, \\ & x_3=z_3/u_3, \quad x_2=(z_2-c_2x_3)/u_2, \quad x_1=(z_1-c_1x_2)/u_1. \end{aligned}$

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lyche-numerical-linear-algebra_ EQ0836 (13.2)	291	0.546	\left|\boldsymbol{x}^{T} \boldsymbol{A y}\right|^{2} \leq\left(\boldsymbol{x}^{T} \boldsymbol{A x}\right) \left(\boldsymbol{y}^{T} \boldsymbol{A y}\right), \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n} .	$\left\|\boldsymbol{x}^{T} \boldsymbol{A y}\right\|^{2} \leq\left(\boldsymbol{x}^{T} \boldsymbol{A x}\right) \left(\boldsymbol{y}^{T} \boldsymbol{A y}\right), \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n} .$	$\|\boldsymbol{x}^{T} \boldsymbol{A y}\|^{2} \leq\left(\boldsymbol{x}^{T} \boldsymbol{A x}\right)\left(\boldsymbol{y}^{T} \boldsymbol{A y}\right), \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n} .$
lyche-numerical-linear-algebra_ EQ0868	301	0.546	\left|\boldsymbol{x}-\boldsymbol{x}_{0}- \boldsymbol{w}\right|_{\boldsymbol{A}}=\left| \boldsymbol{x}-\boldsymbol{x}_{k}+\boldsymbol{u} \right|_{\boldsymbol{A}} \geq\left|\boldsymbol{x}- \boldsymbol{x}_{k}\right|_{\boldsymbol{A}},	$\left\|\boldsymbol{x}-\boldsymbol{x}_{0}-\boldsymbol{w}\right\|_{\boldsymbol{A}}=\left\|\boldsymbol{x}-\boldsymbol{x}_{k}+\boldsymbol{u}\right\|_{\boldsymbol{A}} \geq\left\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\|_{\boldsymbol{A}},$	$\|\boldsymbol{x}-\boldsymbol{x}_{0}-\boldsymbol{w}\|_{\boldsymbol{A}}=\|\boldsymbol{x}-\boldsymbol{x}_{k}+\boldsymbol{u}\|_{\boldsymbol{A}} \geq\|\boldsymbol{x}-\boldsymbol{x}_{k}\|_{\boldsymbol{A}},$
lyche-numerical-linear-algebra_ EQ0918	312	0.547	\frac{\left|\boldsymbol{y}-\boldsymbol{y}_{k}\right |_{\boldsymbol{C A C}^{T}}}{\left|\boldsymbol{y}- \boldsymbol{y}_{0}\right|_{\boldsymbol{C A C}^{T}}} \leq 2\left(\frac{\sqrt{\kappa}-1}{\sqrt{\kappa}+1} \right)^{k}, \quad \text { for } \quad k \geq 0,	$\frac{\left\|\boldsymbol{y}-\boldsymbol{y}_{k}\right\|_{\boldsymbol{C A C}^{T}}}{\left\|\boldsymbol{y}-\boldsymbol{y}_{0}\right\|_{\boldsymbol{C A C}^{T}}} \leq 2\left(\frac{\sqrt{\kappa}-1}{\sqrt{\kappa}+1}\right)^{k}, \quad \text { for } \quad k \geq 0,$	$\frac{\|\boldsymbol{y}-\boldsymbol{y}_{k}\|_{\boldsymbol{C A C}^{T}}}{\|\boldsymbol{y}-\boldsymbol{y}_{0}\|_{\boldsymbol{C A C}^{T}}} \leq 2\left(\frac{\sqrt{\kappa}-1}{\sqrt{\kappa}+1}\right)^{k}, \quad \text { for } \quad k \geq 0,$
lyche-numerical-linear-algebra_ EQ0386	156	0.548	\boldsymbol{R}:=\left[\begin{array}{ccc} \boldsymbol{D}_{1} & \boldsymbol{R}_{1,2} & \boldsymbol{R}_{1,3} \\ \mathbf{0} & \boldsymbol{D}_{2} & \boldsymbol{R}_{2,3} \\ \mathbf{0} & \mathbf{0} & \boldsymbol{D}_{3} \end{array}\right], \boldsymbol{D}_{1}:=\left[\begin{array}{cc} 2 & 1 \\ -1 & 2 \end{array}\right], \boldsymbol{D}_{2}:=[1], \boldsymbol{D}_{3}:=\left[\begin{array}{cc} 3 & 2 \\ -1 & 1 \end{array}\right] .	$\boldsymbol{R}:=\left[\begin{array}{ccc} \boldsymbol{D}_{1} & \boldsymbol{R}_{1,2} & \boldsymbol{R}_{1,3} \\ \mathbf{0} & \boldsymbol{D}_{2} & \boldsymbol{R}_{2,3} \\ \mathbf{0} & \mathbf{0} & \boldsymbol{D}_{3} \end{array}\right], \boldsymbol{D}_{1}:=\left[\begin{array}{cc} 2 & 1 \\ -1 & 2 \end{array}\right], \boldsymbol{D}_{2}:=[1], \boldsymbol{D}_{3}:=\left[\begin{array}{cc} 3 & 2 \\ -1 & 1 \end{array}\right] .$	$\boldsymbol{R}:=\left[\begin{array}{ccc} \boldsymbol{D}_{1} & \boldsymbol{R}_{1,2} & \boldsymbol{R}_{1,3} \\ \mathbf{0} & \boldsymbol{D}_{2} & \boldsymbol{R}_{2,3} \\ \mathbf{0} & \mathbf{0} & \boldsymbol{D}_{3} \end{array}\right], \boldsymbol{D}_{1}:=\left[\begin{array}{cc} 2 & 1 \\ -1 & 2 \end{array}\right], \boldsymbol{D}_{2}:=[1], \boldsymbol{D}_{3}:=\left[\begin{array}{cc} 3 & 2 \\ -1 & 1 \end{array}\right] .$
lyche-numerical-linear-algebra_ EQ0185	79	0.548	l_{i k}^{(k)} a_{k j}^{(k)}=a_{i j}^{(k)}-a_{i j}^{(k+1)} \text { for } k<\min (i, j) \text {, and } l_{i j}^{(k)} a_{j j}^{(j)}=a_{i j}^{(j)} \text { for } i>j .	$l_{i k}^{(k)} a_{k j}^{(k)}=a_{i j}^{(k)}-a_{i j}^{(k+1)} \text { for } k<\min (i, j) \text {, and } l_{i j}^{(k)} a_{j j}^{(j)}=a_{i j}^{(j)} \text { for } i>j .$	$l_{i k}^{(k)} a_{k j}^{(k)}=a_{i j}^{(k)}-a_{i j}^{(k+1)} \text { for } k<\min (i, j) \text {, and } l_{i j}^{(k)} a_{j j}^{(j)}=a_{i j}^{(j)} \text { for } i>j .$
lyche-numerical-linear-algebra_ EQ0313	126	0.549	\begin{aligned} \boldsymbol{H} \boldsymbol{x} & = \boldsymbol{x}-\left(\boldsymbol{u}^{*} \boldsymbol{x} \right) \boldsymbol{u}=\rho\\|\boldsymbol{x}\\|_{2}\left(\boldsymbol{z}-\left(\boldsymbol{u}^{*} \boldsymbol{z} \right) \boldsymbol{u}\right)=\rho\\|\boldsymbol{x}\\|_{2} \left(z-\frac{\left(z^{*}+\boldsymbol{e}_{1}^{*}\right) \boldsymbol{z}}{1+z_{1}}\left(z+\boldsymbol{e}_{1}\right) \right) \\ & =\rho\\|\boldsymbol{x}\\|_{2}\left(z-\left(z+ \boldsymbol{e}_{1}\right)\right)=-\rho\\|\boldsymbol{x} \\|_{2} \boldsymbol{e}_{1}=a \boldsymbol{e}_{1} \end{aligned}	$\begin{aligned} \boldsymbol{H} \boldsymbol{x} & = \boldsymbol{x}-\left(\boldsymbol{u}^{*} \boldsymbol{x} \right) \boldsymbol{u}=\rho\|\boldsymbol{x}\|_{2}\left(\boldsymbol{z}-\left(\boldsymbol{u}^{*} \boldsymbol{z} \right) \boldsymbol{u}\right)=\rho\|\boldsymbol{x}\|_{2} \left(z-\frac{\left(z^{*}+\boldsymbol{e}_{1}^{*}\right) \boldsymbol{z}}{1+z_{1}}\left(z+\boldsymbol{e}_{1}\right) \right) \\ & =\rho\|\boldsymbol{x}\|_{2}\left(z-\left(z+ \boldsymbol{e}_{1}\right)\right)=-\rho\|\boldsymbol{x}\|_{2} \boldsymbol{e}_{1}=a \boldsymbol{e}_{1} \end{aligned}$	$\begin{aligned} \boldsymbol{H} \boldsymbol{x} & = \boldsymbol{x}-\left(\boldsymbol{u}^{*} \boldsymbol{x} \right) \boldsymbol{u}=\rho\|\boldsymbol{x}\|_{2}\left(\boldsymbol{z}-\left(\boldsymbol{u}^{*} \boldsymbol{z} \right) \boldsymbol{u}\right)=\rho\|\boldsymbol{x}\|_{2} \left(z-\frac{\left(z^{*}+\boldsymbol{e}_{1}^{*}\right) \boldsymbol{z}}{1+z_{1}}\left(z+\boldsymbol{e}_{1}\right) \right) \\ & =\rho\|\boldsymbol{x}\|_{2}\left(z-\left(z+ \boldsymbol{e}_{1}\right)\right)=-\rho\|\boldsymbol{x}\|_{2} \boldsymbol{e}_{1}=a \boldsymbol{e}_{1} \end{aligned}$
lyche-numerical-linear-algebra_ EQ0129 (89)	63	0.550	\boldsymbol{A}_{11}=[1], \quad \boldsymbol{A}_{12}=[2,3], \quad \boldsymbol{A}_{21}=\left[\begin{array}{l} 4 \\ 7 \end{array}\right], \quad \text { and } \boldsymbol{A}_{22}=\left[\begin{array}{ll} 5 & 6 \\ 8 & 9 \end{array}\right],	$\boldsymbol{A}_{11}=[1], \quad \boldsymbol{A}_{12}=[2,3], \quad \boldsymbol{A}_{21}=\left[\begin{array}{l} 4 \\ 7 \end{array}\right], \quad \text { and } \boldsymbol{A}_{22}=\left[\begin{array}{ll} 5 & 6 \\ 8 & 9 \end{array}\right],$	$\boldsymbol{A}_{11}=[1], \boldsymbol{A}_{12}=[2,3], \boldsymbol{A}_{21}=\left[\begin{array}{l} 4 \\ 7 \end{array}\right], \text { and } \boldsymbol{A}_{22}=\left[\begin{array}{ll} 5 & 6 \\ 8 & 9 \end{array}\right],$

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lyche-numerical-linear-algebra_EQ0117 (2.27)	60	0.551	\boldsymbol{T}=\boldsymbol{T}_{m}:= \operatorname{tridiag}_{m}(-1,2,-1)-=\left[\begin{array}{rrrrr} 2 & -1 & 0 & & \\ -1 & 2 & -1 & & \\ 0 & \ddots & \ddots & \ddots & \\ & & & 0 & \\ & & & -1 & 2 -1 \\ & & & 0 -1 & 2 \end{array}\right] \in \mathbb{R}^{m \times m} .	$\boldsymbol{T}=\boldsymbol{T}_m:=\operatorname{tridiag}_m(-1,2,-1)-=\begin{bmatrix} 2 & -1 & 0 & & & \\ -1 & 2 & -1 & & & \\ 0 & \ddots & \ddots & \ddots & & \\ & & & 0 & & \\ & & & -1 & 2 & -1 \\ & & & 0 & -1 & 2 \end{bmatrix} \in \mathbb{R}^{m \times m}.$	$\boldsymbol{T}=\boldsymbol{T}_m:=\operatorname{tridiag}_m(-1,2,-1)-=\begin{bmatrix} 2 & -1 & 0 & & & \\ -1 & 2 & -1 & & & \\ 0 & \ddots & \ddots & \ddots & & \\ & & & & & 0 \\ & & & -1 & 2 & -1 \\ & & & 0 & -1 & 2 \end{bmatrix} \in \mathbb{R}^{m \times m}.$
lyche-numerical-linear-algebra_EQ0577	214	0.552	\boldsymbol{A} \boldsymbol{x}=\left[\begin{array}{c} p \left(t_{1}\right) \\ \vdots \\ p\left(t_{m}\right) \end{array}\right]=\left[\begin{array}{ll} 1 & t_{1} \\ \vdots \\ 1 & t_{m} \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right]=\left[\begin{array}{c} y_{1} \\ \vdots \\ y_{m} \end{array} \right]=\boldsymbol{b} .	$\boldsymbol{A} \boldsymbol{x}=\left[\begin{array}{c} p\left(t_{1}\right) \\ \vdots \\ p\left(t_{m}\right) \end{array}\right]=\left[\begin{array}{ll} 1 & t_{1} \\ \vdots & \\ 1 & t_{m} \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right]=\left[\begin{array}{c} y_{1} \\ \vdots \\ y_{m} \end{array}\right]=\boldsymbol{b}.$	$\boldsymbol{A} \boldsymbol{x}=\left[\begin{array}{c} p(t_{1}) \\ \vdots \\ p(t_{m}) \end{array}\right]=\left[\begin{array}{ll} 1 & t_{1} \\ \vdots & \vdots \\ 1 & t_{m} \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right]=\left[\begin{array}{c} y_{1} \\ \vdots \\ y_{m} \end{array}\right]=\boldsymbol{b}.$
lyche-numerical-linear-algebra_EQ0569	211	0.554	\boldsymbol{A} \hat{\boldsymbol{s}}=\boldsymbol{b}+ \boldsymbol{e} .	$\boldsymbol{A} \hat{\boldsymbol{s}}=\boldsymbol{b}+\boldsymbol{e}.$	$\boldsymbol{A} \hat{\boldsymbol{s}}=\boldsymbol{b}+\boldsymbol{e}.$
lyche-numerical-linear-algebra_EQ0336	136	0.557	\boldsymbol{A}=\left[\begin{array}{llll} x & x & x & x \\ x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \end{array}\right] \xrightarrow{\boldsymbol{P}_{12}} \left[\begin{array}{cccc} r_{11} & r_{12} & r_{13} & r_{14} \\ \mathbf{0} & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \end{array}\right] \xrightarrow{\boldsymbol{P}_{23}}\left[\begin{array}{cccc} r_{11} & r_{12} & r_{13} & r_{14} \\ 0 & r_{22} & r_{23} & r_{24} \\ 0 & \mathbf{0} & x & x \\ 0 & 0 & x & x \end{array}\right] \xrightarrow{\boldsymbol{P}_{34}}\left[\begin{array}{cccc} r_{11} & r_{12} & r_{13} & r_{14} \\ 0 & r_{22} & r_{23} & r_{24} \\ 0 & 0 & r_{33} & r_{34} \\ 0 & 0 & \mathbf{0} & r_{44} \end{array}\right] .	$\boldsymbol{A}=\left[\begin{array}{cccc} x & x & x & x \\ x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \end{array}\right] \xrightarrow{\boldsymbol{P}_{12}} \left[\begin{array}{cccc} r_{11} & r_{12} & r_{13} & r_{14} \\ \mathbf{0} & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \end{array}\right] \xrightarrow{\boldsymbol{P}_{23}} \left[\begin{array}{cccc} r_{11} & r_{12} & r_{13} & r_{14} \\ 0 & r_{22} & r_{23} & r_{24} \\ 0 & \mathbf{0} & x & x \\ 0 & 0 & x & x \end{array}\right] \xrightarrow{\boldsymbol{P}_{34}} \left[\begin{array}{cccc} r_{11} & r_{12} & r_{13} & r_{14} \\ 0 & r_{22} & r_{23} & r_{24} \\ 0 & 0 & r_{33} & r_{34} \\ 0 & 0 & \mathbf{0} & r_{44} \end{array}\right].$
lyche-numerical-linear-algebra_EQ1015	344	0.561	\boldsymbol{A}=\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right], \quad \boldsymbol{z}_{0}:=\left[\begin{array}{l} 1 \\ 0 \end{array}\right] .	$\boldsymbol{A}=\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right], \quad \boldsymbol{z}_0:=\left[\begin{array}{c} 1 \\ 0 \end{array}\right].$	$\boldsymbol{A}=\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right], \quad \boldsymbol{z}_0:=\left[\begin{array}{c} 1 \\ 0 \end{array}\right].$
lyche-numerical-linear-algebra_EQ0919	312	0.563	\begin{aligned} \left\\|\boldsymbol{y}-\boldsymbol{y}_{k} \right\\|_{\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}}^{2} & =\left(\boldsymbol{y}- \boldsymbol{y}_{k}\right)^{T}\left(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}\right)\left(\boldsymbol{y}-\boldsymbol{y}_{k}\right) \\ & =\left(\boldsymbol{C}^{T}\left(\boldsymbol{y}-\boldsymbol{y}_{k} \right)\right)^{T} \boldsymbol{A}\left(\boldsymbol{C}^{T} \left(\boldsymbol{y}-\boldsymbol{y}_{k}\right)\right)= \left\\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\\|_{ \boldsymbol{A}}^{2}, \end{aligned}	$\begin{aligned} \left\\|\boldsymbol{y}-\boldsymbol{y}_{k}\right\\|_{\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}}^{2} & =\left(\boldsymbol{y}-\boldsymbol{y}_{k}\right)^{T}\left(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}\right)\left(\boldsymbol{y}-\boldsymbol{y}_{k}\right) \\ & =\left(\boldsymbol{C}^{T}\left(\boldsymbol{y}-\boldsymbol{y}_{k}\right)\right)^{T} \boldsymbol{A}\left(\boldsymbol{C}^{T}\left(\boldsymbol{y}-\boldsymbol{y}_{k}\right)\right)=\left\\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\\|_{\boldsymbol{A}}^{2}, \end{aligned}$	$\begin{aligned} \left\\|\boldsymbol{y}-\boldsymbol{y}_{k}\right\\|_{\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}}^{2} & =(\boldsymbol{y}-\boldsymbol{y}_{k})^{T}(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T})(\boldsymbol{y}-\boldsymbol{y}_{k}) \\ & =(\boldsymbol{C}^{T}(\boldsymbol{y}-\boldsymbol{y}_{k}))^{T} \boldsymbol{A}(\boldsymbol{C}^{T}(\boldsymbol{y}-\boldsymbol{y}_{k}))=\left\\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\\|_{\boldsymbol{A}}^{2}, \end{aligned}$

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lyche-numerical-linear-algebra_EQ0132	63	0.564	`\boldsymbol{A} \boldsymbol{B}=\left[\begin{array}{c} a_{1:}^{T} \\ a_{2:}^{T} \\ \vdots \\ a_{m:}^{T} \end{array}\right] \boldsymbol{B}=\left[\begin{array}{c} a_{1:}^{T} \boldsymbol{B} \\ a_{2:}^{T} \boldsymbol{B} \\ \vdots \\ a_{m:}^{T} \boldsymbol{B} \end{array}\right],`	$\boldsymbol{A}\boldsymbol{B}=\left[\begin{array}{c} a_{1:}^{T} \\ a_{2:}^{T} \\ \vdots \\ a_{m:}^{T} \end{array}\right] \boldsymbol{B}=\left[\begin{array}{c} a_{1:}^{T}\boldsymbol{B} \\ a_{2:}^{T}\boldsymbol{B} \\ \vdots \\ a_{m:}^{T}\boldsymbol{B} \end{array}\right],$	$\boldsymbol{A}\boldsymbol{B}=\left[\begin{array}{c} a_{1:}^{T} \\ a_{2:}^{T} \\ \vdots \\ a_{m:}^{T} \end{array}\right] \boldsymbol{B}=\left[\begin{array}{c} a_{1:}^{T}\boldsymbol{B} \\ a_{2:}^{T}\boldsymbol{B} \\ \vdots \\ a_{m:}^{T}\boldsymbol{B} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0425 (7.4)	171	0.564	`\begin{aligned} & \boldsymbol{U}=\left[\boldsymbol{U}_{1}, \boldsymbol{U}_{2}\right] \in \mathbb{C}^{m \times m}, \quad \boldsymbol{U}_{1}:=\left[\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{r}\right], \quad \boldsymbol{U}_{2}:=\left[\boldsymbol{u}_{r+1}, \ldots, \boldsymbol{u}_{m}\right], \\ & \boldsymbol{V}= \left[\boldsymbol{V}_{1}, \boldsymbol{V}_{2}\right] \in \mathbb{C}^{n \times n}, \quad \boldsymbol{V}_{1}:=\left[\boldsymbol{v}_{1}, \ldots, \boldsymbol{v}_{r}\right], \quad \boldsymbol{V}_{2}:=\left[\boldsymbol{v}_{r+1}, \ldots, \boldsymbol{v}_{n}\right], \\ & \boldsymbol{ \Sigma}=\left[\begin{array}{cc} \boldsymbol{\Sigma}_{1} & \mathbf{0}_{r, n-r} \\ \mathbf{0}_{m-r, r} & \mathbf{0}_{m-r, n-r} \end{array}\right] \in \mathbb{R}^{m \times n}, \text { where } \boldsymbol{ \Sigma}_{1}:=\operatorname{diag}\left(\sigma_{1}, \ldots, \sigma_{r}\right) . \end{aligned}`	$\begin{aligned} & \boldsymbol{U}=\left[\boldsymbol{U}_{1}, \boldsymbol{U}_{2}\right] \in \mathbb{C}^{m \times m}, \quad \boldsymbol{U}_{1}:=\left[\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{r}\right], \quad \boldsymbol{U}_{2}:=\left[\boldsymbol{u}_{r+1}, \ldots, \boldsymbol{u}_{m}\right], \\ & \boldsymbol{V}= \left[\boldsymbol{V}_{1}, \boldsymbol{V}_{2}\right] \in \mathbb{C}^{n \times n}, \quad \boldsymbol{V}_{1}:=\left[\boldsymbol{v}_{1}, \ldots, \boldsymbol{v}_{r}\right], \quad \boldsymbol{V}_{2}:=\left[\boldsymbol{v}_{r+1}, \ldots, \boldsymbol{v}_{n}\right], \\ & \boldsymbol{ \Sigma}=\left[\begin{array}{cc} \boldsymbol{\Sigma}_{1} & \mathbf{0}_{r, n-r} \\ \mathbf{0}_{m-r, r} & \mathbf{0}_{m-r, n-r} \end{array}\right] \in \mathbb{R}^{m \times n}, \text { where } \boldsymbol{ \Sigma}_{1}:=\operatorname{diag}\left(\sigma_{1}, \ldots, \sigma_{r}\right) . \end{aligned}$	$\begin{aligned} & \boldsymbol{U}=\left[\boldsymbol{U}_{1}, \boldsymbol{U}_{2}\right] \in \mathbb{C}^{m \times m}, \quad \boldsymbol{U}_{1}:=\left[\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{r}\right], \quad \boldsymbol{U}_{2}:=\left[\boldsymbol{u}_{r+1}, \ldots, \boldsymbol{u}_{m}\right], \\ & \boldsymbol{V}= \left[\boldsymbol{V}_{1}, \boldsymbol{V}_{2}\right] \in \mathbb{C}^{n \times n}, \quad \boldsymbol{V}_{1}:=\left[\boldsymbol{v}_{1}, \ldots, \boldsymbol{v}_{r}\right], \quad \boldsymbol{V}_{2}:=\left[\boldsymbol{v}_{r+1}, \ldots, \boldsymbol{v}_{n}\right], \\ & \boldsymbol{ \Sigma}=\left[\begin{array}{cc} \boldsymbol{\Sigma}_{1} & \mathbf{0}_{r, n-r} \\ \mathbf{0}_{m-r, r} & \mathbf{0}_{m-r, n-r} \end{array}\right] \in \mathbb{R}^{m \times n}, \text { where } \boldsymbol{ \Sigma}_{1}:=\operatorname{diag}\left(\sigma_{1}, \ldots, \sigma_{r}\right) . \end{aligned}$
lyche-numerical-linear-algebra_EQ1016	345	0.571	`z_{1}=\boldsymbol{A} z_{0}=\left[\begin{array}{c} 2 \\ -1 \end{array}\right], \quad z_{2}=\boldsymbol{A} z_{1}=\left[\begin{array}{c} 5 \\ -4 \end{array}\right], \cdots, z_{k}=\frac{1}{2}\left[\begin{array}{l} 1+3^{k} \\ 1-3^{k} \end{array}\right], \cdots .`	$z_{1}=\boldsymbol{A} z_{0}=\left[\begin{array}{c} 2 \\ -1 \end{array}\right], \quad z_{2}=\boldsymbol{A} z_{1}=\left[\begin{array}{c} 5 \\ -4 \end{array}\right], \cdots, z_{k}=\frac{1}{2}\left[\begin{array}{l} 1+3^{k} \\ 1-3^{k} \end{array}\right], \cdots .$	$z_{1}=\boldsymbol{A} z_{0}=\left[\begin{array}{c} 2 \\ -1 \end{array}\right], \quad z_{2}=\boldsymbol{A} z_{1}=\left[\begin{array}{c} 5 \\ -4 \end{array}\right], \cdots, z_{k}=\frac{1}{2}\left[\begin{array}{l} 1+3^{k} \\ 1-3^{k} \end{array}\right], \cdots .$
lyche-numerical-linear-algebra_EQ0834	289	0.578	`\boldsymbol{A}:=\left[\begin{array}{cccccc} \lambda & 0 & \cdots & 0 & 0 & \\ 0 & \lambda & a & \cdots & 0 & 0 \\ 0 & 0 & \lambda & \cdots & 0 & 0 \\ \vdots & & & & \vdots & \\ 0 & 0 & 0 & \cdots & \lambda & a \\ 0 & 0 & 0 & \cdots & 0 & \lambda \end{array}\right] \in \mathbb{R}^{n \times n} .`	$\boldsymbol{A}:=\left[\begin{array}{cccccc} \lambda & 0 & \cdots & 0 & 0 & \\ 0 & \lambda & a & \cdots & 0 & 0 \\ 0 & 0 & \lambda & \cdots & 0 & 0 \\ \vdots & & & & \vdots & \\ 0 & 0 & 0 & \cdots & \lambda & a \\ 0 & 0 & 0 & \cdots & 0 & \lambda \end{array}\right] \in \mathbb{R}^{n \times n}.$	$\boldsymbol{A}:=\left[\begin{array}{cccccc} \lambda & a & 0 & \cdots & 0 & 0 \\ 0 & \lambda & a & \cdots & 0 & 0 \\ 0 & 0 & \lambda & \cdots & 0 & 0 \\ \vdots & & & & \vdots & \\ 0 & 0 & 0 & \cdots & \lambda & a \\ 0 & 0 & 0 & \cdots & 0 & \lambda \end{array}\right] \in \mathbb{R}^{n \times n}.$
lyche-numerical-linear-algebra_EQ0831 (12.47)	287	0.581	`\lambda=\frac{\boldsymbol{x}^{T} \boldsymbol{N} \boldsymbol{x}}{\boldsymbol{x}^{T} \boldsymbol{A x}+ \boldsymbol{x}^{T} \boldsymbol{N} \boldsymbol{x}} .`	$\lambda=\frac{\boldsymbol{x}^{T} \boldsymbol{N} \boldsymbol{x}}{\boldsymbol{x}^{T} \boldsymbol{A x}+ \boldsymbol{x}^{T} \boldsymbol{N} \boldsymbol{x}} .$	$\lambda=\frac{\boldsymbol{x}^{T} \boldsymbol{N} \boldsymbol{x}}{\boldsymbol{x}^{T} \boldsymbol{A x}+ \boldsymbol{x}^{T} \boldsymbol{N} \boldsymbol{x}} .$
lyche-numerical-linear-algebra_EQ0420	169	0.585	`\lambda^{m} \pi_{\boldsymbol{A}^{*} \boldsymbol{A}}( \lambda)=\lambda^{n} \pi_{\boldsymbol{A} \boldsymbol{A}^{*}}(\lambda), \quad \lambda \in \mathbb{C},`	$\lambda^{m} \pi_{\boldsymbol{A}^{*} \boldsymbol{A}}(\lambda)=\lambda^{n} \pi_{\boldsymbol{A} \boldsymbol{A}^{*}}(\lambda), \quad \lambda \in \mathbb{C},$	$\lambda^{m} \pi_{\boldsymbol{A}^{*} \boldsymbol{A}}(\lambda)=\lambda^{n} \pi_{\boldsymbol{A} \boldsymbol{A}^{*}}(\lambda), \quad \lambda \in \mathbb{C},$

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lyche-numerical-linear-algebra_EQ0709	254	0.587	`\begin{aligned} & \boldsymbol{X}=h^{4} \boldsymbol{G} / \boldsymbol{M}, \text { where } \boldsymbol{M}:=\left[\begin{array}{c} \sigma_{1} \\ \vdots \\ \sigma_{m} \end{array}\right][1, \ldots, 1]+\left[\begin{array}{c} 1 \\ \vdots \\ i \end{array}\right]\left[\sigma_{1} \ldots . \sigma_{m}\right], \\ & \boldsymbol{S}=\sin \left(\pi h \left[\begin{array}{c} 1 \\ 2 \\ \vdots \\ m \end{array} \right][12 \ldots m]\right), \quad \boldsymbol{\sigma}= \sin \left(\frac{\pi h}{2}\left[\begin{array}{c} 1 \\ 2 \\ \vdots \\ m \end{array}\right]\right) \wedge 2 . \end{aligned}`	$\boldsymbol{X}=h^{4} \boldsymbol{G} / \boldsymbol{M}, \text { where } \boldsymbol{M}:=\left[\begin{array}{c} \sigma_{1} \\ \vdots \\ \sigma_{m} \end{array}\right][1, \ldots, 1]+\left[\begin{array}{c} 1 \\ \vdots \\ i \end{array}\right]\left[\sigma_{1} \ldots . \sigma_{m}\right], \\ \boldsymbol{S}=\sin \left(\pi h \left[\begin{array}{c} 1 \\ 2 \\ \vdots \\ m \end{array} \right][12 \ldots m]\right), \quad \boldsymbol{\sigma}= \sin \left(\frac{\pi h}{2}\left[\begin{array}{c} 1 \\ 2 \\ \vdots \\ m \end{array}\right]\right) \wedge 2.$	$\boldsymbol{X}=h^{4} \boldsymbol{G} / \boldsymbol{M}, \text { where } \boldsymbol{M}:=\left[\begin{array}{c} \sigma_{1} \\ \vdots \\ \sigma_{m} \end{array}\right][1, \ldots, 1]+\left[\begin{array}{c} 1 \\ \vdots \\ i \end{array}\right]\left[\sigma_{1} \ldots . \sigma_{m}\right], \\ \boldsymbol{S}=\sin \left(\pi h \left[\begin{array}{c} 1 \\ 2 \\ \vdots \\ m \end{array} \right][12 \ldots m]\right), \quad \boldsymbol{\sigma}= \sin \left(\frac{\pi h}{2}\left[\begin{array}{c} 1 \\ 2 \\ \vdots \\ m \end{array}\right]\right) \wedge 2.$
lyche-numerical-linear-algebra_EQ0644	232	0.587	`\begin{array}{cl} \boldsymbol{A B A}=\boldsymbol{A} & (1) \quad \boldsymbol{A C A}=\boldsymbol{A}, \\ \boldsymbol{B A B}=\boldsymbol{B} & (2) \quad \boldsymbol{C A C}= \boldsymbol{C}, \\ (\boldsymbol{A B})^{*}=\boldsymbol{A B} & (3) \quad(\boldsymbol{A C})^{*}=\boldsymbol{A C}, \\ (\boldsymbol{B A})^{*}=\boldsymbol{B A} & (4) \quad(\boldsymbol{C A})^{*}=\boldsymbol{C A} . \end{array}`	$\begin{array}{cl} \boldsymbol{A B A}=\boldsymbol{A} & (1) \quad \boldsymbol{A C A}=\boldsymbol{A}, \\ \boldsymbol{B A B}=\boldsymbol{B} & (2) \quad \boldsymbol{C A C}= \boldsymbol{C}, \\ (\boldsymbol{A B})^{*}=\boldsymbol{A B} & (3) \quad(\boldsymbol{A C})^{*}=\boldsymbol{A C}, \\ (\boldsymbol{B A})^{*}=\boldsymbol{B A} & (4) \quad(\boldsymbol{C A})^{*}=\boldsymbol{C A} . \end{array}$	$\begin{array}{cl} \boldsymbol{A B A}=\boldsymbol{A} & (1) \quad \boldsymbol{A C A}=\boldsymbol{A}, \\ \boldsymbol{B A B}=\boldsymbol{B} & (2) \quad \boldsymbol{C A C}= \boldsymbol{C}, \\ (\boldsymbol{A B})^{*}=\boldsymbol{A B} & (3) \quad(\boldsymbol{A C})^{*}=\boldsymbol{A C}, \\ (\boldsymbol{B A})^{*}=\boldsymbol{B A} & (4) \quad(\boldsymbol{C A})^{*}=\boldsymbol{C A} . \end{array}$
lyche-numerical-linear-algebra_EQ0171	76	0.588	`\begin{aligned} a_{11}^{(1)} x_{1}+a_{12}^{(1)} x_{2}+a_{13}^{(1)} x_{3}=b_{1}^{(1)}, & \mathrm{I} \\ a_{22}^{(2)} x_{2}+a_{23}^{(2)} x_{3}=b_{2}^{(2)}, & \mathrm{II}^{\prime} \\ a_{32}^{(2)} x_{2}+a_{33}^{(2)} x_{3}=b_{3}^{(2)}, & \mathrm{III}^{\prime}, \end{aligned}`	$\begin{aligned} a_{11}^{(1)} x_{1}+a_{12}^{(1)} x_{2}+a_{13}^{(1)} x_{3}=b_{1}^{(1)}, & \mathrm{I} \\ a_{22}^{(2)} x_{2}+a_{23}^{(2)} x_{3}=b_{2}^{(2)}, & \mathrm{II}^{\prime} \\ a_{32}^{(2)} x_{2}+a_{33}^{(2)} x_{3}=b_{3}^{(2)}, & \mathrm{III}^{\prime}, \end{aligned}$	$\begin{aligned} a_{11}^{(1)} x_{1}+a_{12}^{(1)} x_{2}+a_{13}^{(1)} x_{3}=b_{1}^{(1)}, & \mathrm{I} \\ a_{22}^{(2)} x_{2}+a_{23}^{(2)} x_{3}=b_{2}^{(2)}, & \mathrm{II}^{\prime} \\ a_{32}^{(2)} x_{2}+a_{33}^{(2)} x_{3}=b_{3}^{(2)}, & \mathrm{III}^{\prime}, \end{aligned}$
lyche-numerical-linear-algebra_EQ0467 (8.4)	186	0.589	`\lim _{p \rightarrow \infty}\\|\boldsymbol{x}\\|_{p}= \\|\boldsymbol{x}\\|_{\infty} \text { for all } \boldsymbol{x} \in \mathbb{C}^{n} .`	$\lim_{p \rightarrow \infty}\|\boldsymbol{x}\|_{p}=\|\boldsymbol{x}\|_{\infty} \text { for all } \boldsymbol{x} \in \mathbb{C}^{n} .$	$\lim_{p \rightarrow \infty}\|\boldsymbol{x}\|_{p}=\|\boldsymbol{x}\|_{\infty} \text { for all } \boldsymbol{x} \in \mathbb{C}^{n} .$
lyche-numerical-linear-algebra_EQ0793	279	0.592	`k=-\frac{s \log (10)}{\log (1-\eta)} \approx \frac{s \log (10)}{\eta}=\tilde{k} .`	$k=-\frac{s \log (10)}{\log (1-\eta)} \approx \frac{s \log (10)}{\eta}=\tilde{k} .$	$k=-\frac{s \log (10)}{\log (1-\eta)} \approx \frac{s \log (10)}{\eta}=\tilde{k} .$
lyche-numerical-linear-algebra_EQ1023 (15.6)	346	0.600	`\begin{array}{ll} \text { (i) } & \boldsymbol{y}_{k}= \boldsymbol{A} \boldsymbol{x}_{k-1} \\ \text { (ii) } & \boldsymbol{x}_{k}=\boldsymbol{y}_{k} /\left| \boldsymbol{y}_{k}\right| . \end{array}`	$\begin{array}{ll} \text { (i) } & \boldsymbol{y}_{k}= \boldsymbol{A} \boldsymbol{x}_{k-1} \\ \text { (ii) } & \boldsymbol{x}_{k}=\boldsymbol{y}_{k} /\left\| \boldsymbol{y}_{k}\right\| . \end{array}$	$\begin{array}{ll} \text { (i) } & \boldsymbol{y}_{k}= \boldsymbol{A} \boldsymbol{x}_{k-1} \\ \text { (ii) } & \boldsymbol{x}_{k}=\boldsymbol{y}_{k} /\left\| \boldsymbol{y}_{k}\right\| . \end{array}$
lyche-numerical-linear-algebra_EQ0935	317	0.600	`\lambda=\frac{x^{T} \boldsymbol{A x}}{x^{T} \boldsymbol{A}_{p} x} .`	$\lambda=\frac{x^{T} \boldsymbol{A x}}{x^{T} \boldsymbol{A}_{p} x} .$	$\lambda=\frac{x^{T} \boldsymbol{A x}}{x^{T} \boldsymbol{A}_{p} x} .$

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lyche-numerical-linear-algebra_EQ0901	308	0.602	`\begin{aligned} \left\\|\boldsymbol{\epsilon}_{k} \right\\|_{\boldsymbol{A}}^{2} & =\boldsymbol{ \epsilon}_{k}^{T} \boldsymbol{A} \boldsymbol{ \epsilon}_{k}=\boldsymbol{r}_{k}^{T} \boldsymbol{A}^{-1} \boldsymbol{r}_{k}, \\ \left\\|\boldsymbol{\epsilon}_{k+1} \right\\|_{\boldsymbol{A}}^{2} & =\left(\boldsymbol{ \epsilon}_{k}-\alpha_{k} \boldsymbol{r}_{k}\right)^{T} \boldsymbol{A}\left(\boldsymbol{\epsilon}_{k}- \alpha_{k} \boldsymbol{r}_{k}\right) \\ & =\boldsymbol{ \epsilon}_{k}^{T} \boldsymbol{A} \boldsymbol{ \epsilon}_{k}-2 \alpha_{k} \boldsymbol{r}_{k}^{T} \boldsymbol{A} \boldsymbol{\epsilon}_{k}+\alpha_{k}^{2} \boldsymbol{r}_{k}^{T} \boldsymbol{A} \boldsymbol{r}_{k}= \left\\|\boldsymbol{\epsilon}_{k}\right\\|_{ \boldsymbol{A}}^{2}-\frac{\left(\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}\right)^{2}}{\boldsymbol{r}_{k}^{T} \boldsymbol{A} \boldsymbol{r}_{k}} \end{aligned}`	$\begin{aligned} \left\\|\boldsymbol{\epsilon}_{k} \right\\|_{\boldsymbol{A}}^{2} & =\boldsymbol{ \epsilon}_{k}^{T} \boldsymbol{A} \boldsymbol{ \epsilon}_{k}=\boldsymbol{r}_{k}^{T} \boldsymbol{A}^{-1} \boldsymbol{r}_{k}, \\ \left\\|\boldsymbol{\epsilon}_{k+1} \right\\|_{\boldsymbol{A}}^{2} & =\left(\boldsymbol{ \epsilon}_{k}-\alpha_{k} \boldsymbol{r}_{k}\right)^{T} \boldsymbol{A}\left(\boldsymbol{\epsilon}_{k}- \alpha_{k} \boldsymbol{r}_{k}\right) \\ & =\boldsymbol{ \epsilon}_{k}^{T} \boldsymbol{A} \boldsymbol{ \epsilon}_{k}-2 \alpha_{k} \boldsymbol{r}_{k}^{T} \boldsymbol{A} \boldsymbol{\epsilon}_{k}+\alpha_{k}^{2} \boldsymbol{r}_{k}^{T} \boldsymbol{A} \boldsymbol{r}_{k}= \left\\|\boldsymbol{\epsilon}_{k}\right\\|_{ \boldsymbol{A}}^{2}-\frac{\left(\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}\right)^{2}}{\boldsymbol{r}_{k}^{T} \boldsymbol{A} \boldsymbol{r}_{k}} \end{aligned}$	$\begin{aligned} \left\\|\boldsymbol{\epsilon}_{k} \right\\|_{\boldsymbol{A}}^{2} & =\boldsymbol{ \epsilon}_{k}^{T} \boldsymbol{A} \boldsymbol{ \epsilon}_{k}=\boldsymbol{r}_{k}^{T} \boldsymbol{A}^{-1} \boldsymbol{r}_{k}, \\ \left\\|\boldsymbol{\epsilon}_{k+1} \right\\|_{\boldsymbol{A}}^{2} & =\left(\boldsymbol{ \epsilon}_{k}-\alpha_{k} \boldsymbol{r}_{k}\right)^{T} \boldsymbol{A}\left(\boldsymbol{\epsilon}_{k}- \alpha_{k} \boldsymbol{r}_{k}\right) \\ & =\boldsymbol{ \epsilon}_{k}^{T} \boldsymbol{A} \boldsymbol{ \epsilon}_{k}-2 \alpha_{k} \boldsymbol{r}_{k}^{T} \boldsymbol{A} \boldsymbol{\epsilon}_{k}+\alpha_{k}^{2} \boldsymbol{r}_{k}^{T} \boldsymbol{A} \boldsymbol{r}_{k}= \left\\|\boldsymbol{\epsilon}_{k}\right\\|_{ \boldsymbol{A}}^{2}-\frac{\left(\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}\right)^{2}}{\boldsymbol{r}_{k}^{T} \boldsymbol{A} \boldsymbol{r}_{k}} \end{aligned}$
lyche-numerical-linear-algebra_EQ0892 (13.37)	307	0.606	`a:=\frac{\boldsymbol{y}^{T} \boldsymbol{A y}}{ \boldsymbol{y}^{T} \boldsymbol{y}}=\sum_{i=1}^{n} t_{i} \lambda_{i}, \quad b:=\frac{\boldsymbol{y}^{T} \boldsymbol{A}^{-1} \boldsymbol{y}}{\boldsymbol{y}^{T} \boldsymbol{y}}=\sum_{i=1}^{n} \frac{t_{i}}{\lambda_{i}},`	$a:=\frac{\boldsymbol{y}^{T} \boldsymbol{A y}}{ \boldsymbol{y}^{T} \boldsymbol{y}}=\sum_{i=1}^{n} t_{i} \lambda_{i}, \quad b:=\frac{\boldsymbol{y}^{T} \boldsymbol{A}^{-1} \boldsymbol{y}}{\boldsymbol{y}^{T} \boldsymbol{y}}=\sum_{i=1}^{n} \frac{t_{i}}{\lambda_{i}},$	$a:=\frac{\boldsymbol{y}^{T} \boldsymbol{A y}}{ \boldsymbol{y}^{T} \boldsymbol{y}}=\sum_{i=1}^{n} t_{i} \lambda_{i}, \quad b:=\frac{\boldsymbol{y}^{T} \boldsymbol{A}^{-1} \boldsymbol{y}}{\boldsymbol{y}^{T} \boldsymbol{y}}=\sum_{i=1}^{n} \frac{t_{i}}{\lambda_{i}},$
lyche-numerical-linear-algebra_EQ1029	348	0.608	`\boldsymbol{A}_{1}:=\left[\begin{array}{ll} 1 & 2 \\ 3 & 4 \end{array}\right], \quad \boldsymbol{A}_{2}:=\left[ \begin{array}{cc} 1.7 & -0.4 \\ 0.15 & 2.2 \end{array} \right], \quad \text { and } \boldsymbol{A}_{3}=\left[ \begin{array}{cc} 1 & 2 \\ -3 & 4 \end{array}\right] .`	$\boldsymbol{A}_{1}:=\left[\begin{array}{ll} 1 & 2 \\ 3 & 4 \end{array}\right], \quad \boldsymbol{A}_{2}:=\left[\begin{array}{cc} 1.7 & -0.4 \\ 0.15 & 2.2 \end{array} \right], \quad \text { and } \boldsymbol{A}_{3}=\left[\begin{array}{cc} 1 & 2 \\ -3 & 4 \end{array}\right] .$	$\boldsymbol{A}_{1}:=\left[\begin{array}{ll} 1 & 2 \\ 3 & 4 \end{array}\right], \quad \boldsymbol{A}_{2}:=\left[\begin{array}{cc} 1.7 & -0.4 \\ 0.15 & 2.2 \end{array} \right], \quad \text { and } \boldsymbol{A}_{3}=\left[\begin{array}{cc} 1 & 2 \\ -3 & 4 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0379	154	0.611	`\begin{aligned} \boldsymbol{A} \boldsymbol{A}^{*} & = \left(\boldsymbol{U} \boldsymbol{B} \boldsymbol{U}^{*} \right)\left(\boldsymbol{U} \boldsymbol{B}^{*} \boldsymbol{U}^{*}\right)=\boldsymbol{U} \boldsymbol{B} \boldsymbol{B}^{*} \boldsymbol{U}^{*} \text { and } \\ \boldsymbol{A}^{*} \boldsymbol{A} & =\left(\boldsymbol{U} \boldsymbol{B}^{*} \boldsymbol{U}^{*}\right)\left(\boldsymbol{U} \boldsymbol{B} \boldsymbol{U}^{*}\right)= \boldsymbol{U} \boldsymbol{B}^{*} \boldsymbol{B} \boldsymbol{U}^{*} . \end{aligned}`	$\begin{aligned} \boldsymbol{A} \boldsymbol{A}^{*} & = \left(\boldsymbol{U} \boldsymbol{B} \boldsymbol{U}^{*} \right)\left(\boldsymbol{U} \boldsymbol{B}^{*} \boldsymbol{U}^{*}\right)=\boldsymbol{U} \boldsymbol{B} \boldsymbol{B}^{*} \boldsymbol{U}^{*} \text { and } \\ \boldsymbol{A}^{*} \boldsymbol{A} & =\left(\boldsymbol{U} \boldsymbol{B}^{*} \boldsymbol{U}^{*}\right)\left(\boldsymbol{U} \boldsymbol{B} \boldsymbol{U}^{*}\right)= \boldsymbol{U} \boldsymbol{B}^{*} \boldsymbol{B} \boldsymbol{U}^{*} . \end{aligned}$	$\begin{aligned} \boldsymbol{A} \boldsymbol{A}^{*} & = \left(\boldsymbol{U} \boldsymbol{B} \boldsymbol{U}^{*} \right)\left(\boldsymbol{U} \boldsymbol{B}^{*} \boldsymbol{U}^{*}\right)=\boldsymbol{U} \boldsymbol{B} \boldsymbol{B}^{*} \boldsymbol{U}^{*} \text { and } \\ \boldsymbol{A}^{*} \boldsymbol{A} & =\left(\boldsymbol{U} \boldsymbol{B}^{*} \boldsymbol{U}^{*}\right)\left(\boldsymbol{U} \boldsymbol{B} \boldsymbol{U}^{*}\right)= \boldsymbol{U} \boldsymbol{B}^{*} \boldsymbol{B} \boldsymbol{U}^{*} . \end{aligned}$
lyche-numerical-linear-algebra_EQ1031 (15.7)	349	0.611	`\begin{array}{ll} \text { (i) } & (\boldsymbol{A}-s \boldsymbol{I}) \boldsymbol{y}_{k}=\boldsymbol{x}_{k-1} \\ \text { (ii) } & \boldsymbol{x}_{k}=\boldsymbol{y}_{k}/\left\\|\boldsymbol{y}_{k}\right\\| . \end{array}`	$\begin{array}{ll} \text { (i) } & (\boldsymbol{A}-s \boldsymbol{I}) \boldsymbol{y}_{k}=\boldsymbol{x}_{k-1} \\ \text { (ii) } & \boldsymbol{x}_{k}=\boldsymbol{y}_{k}/\left\\|\boldsymbol{y}_{k}\right\\| . \end{array}$	$\begin{array}{ll} \text { (i) } & (\boldsymbol{A}-s \boldsymbol{I}) \boldsymbol{y}_{k}=\boldsymbol{x}_{k-1} \\ \text { (ii) } & \boldsymbol{x}_{k}=\boldsymbol{y}_{k}/\left\\|\boldsymbol{y}_{k}\right\\| . \end{array}$

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lyche-numerical-linear-algebra_EQ1011	341	0.614	\boldsymbol{A}:=\left[\begin{array}{llll} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{array}\right], \quad \boldsymbol{E}:=\left[\begin{array}{llll} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ \epsilon & 0 & 0 & 0 \end{array}\right], \quad \boldsymbol{B}:=\left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ \epsilon & 0 & 0 & 0 \end{array}\right] .	$\boldsymbol{A}:=\left[\begin{array}{llll} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{array}\right], \quad \boldsymbol{E}:=\left[\begin{array}{llll} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ \epsilon & 0 & 0 & 0 \end{array}\right], \quad \boldsymbol{B}:=\left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ \epsilon & 0 & 0 & 0 \end{array}\right] .$	$\boldsymbol{A}:=\left[\begin{array}{llll} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{array}\right], \quad \boldsymbol{E}:=\left[\begin{array}{llll} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ \epsilon & 0 & 0 & 0 \end{array}\right], \quad \boldsymbol{B}:=\left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ \epsilon & 0 & 0 & 0 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0011	24	0.618	\boldsymbol{A}(\boldsymbol{i}, \boldsymbol{j}):= \boldsymbol{A}\left(\begin{array}{cccc} i_{1} & i_{2} & \cdots & i_{r} \\ j_{1} & j_{2} & \cdots & j_{c} \end{array}\right)=\left[\begin{array}{cccc} a_{i_{1}, j_{1}} & a_{i_{1}, j_{2}} & \cdots & a_{i_{1}, j_{c}} \\ a_{i_{2}, j_{1}} & a_{i_{2}, j_{2}} & \cdots & a_{i_{2}, j_{c}} \\ \vdots & \vdots & \ddots & \vdots \\ a_{i_{r}, j_{1}} & a_{i_{r}, j_{2}} & \cdots & a_{i_{r}, j_{c}} \end{array}\right] .	$\boldsymbol{A}(\boldsymbol{i}, \boldsymbol{j}):=\boldsymbol{A}\left(\begin{array}{cccc} i_{1} & i_{2} & \cdots & i_{r} \\ j_{1} & j_{2} & \cdots & j_{c} \end{array}\right)=\left[\begin{array}{cccc} a_{i_{1}, j_{1}} & a_{i_{1}, j_{2}} & \cdots & a_{i_{1}, j_{c}} \\ a_{i_{2}, j_{1}} & a_{i_{2}, j_{2}} & \cdots & a_{i_{2}, j_{c}} \\ \vdots & \vdots & \ddots & \vdots \\ a_{i_{r}, j_{1}} & a_{i_{r}, j_{2}} & \cdots & a_{i_{r}, j_{c}} \end{array}\right] .$	$\boldsymbol{A}(\boldsymbol{i}, \boldsymbol{j}):=\boldsymbol{A}\left(\begin{array}{cccc} i_{1} & i_{2} & \cdots & i_{r} \\ j_{1} & j_{2} & \cdots & j_{c} \end{array}\right)=\left[\begin{array}{cccc} a_{i_{1}, j_{1}} & a_{i_{1}, j_{2}} & \cdots & a_{i_{1}, j_{c}} \\ a_{i_{2}, j_{1}} & a_{i_{2}, j_{2}} & \cdots & a_{i_{2}, j_{c}} \\ \vdots & \vdots & \ddots & \vdots \\ a_{i_{r}, j_{1}} & a_{i_{r}, j_{2}} & \cdots & a_{i_{r}, j_{c}} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0249 (4.4)	102	0.629	\boldsymbol{a}_{n}=\boldsymbol{L}_{n-1} \boldsymbol{D}_{n-1} \boldsymbol{l}_{n}, \quad a_{n n}=\boldsymbol{l}_{n}^{*} \boldsymbol{D}_{n-1} \boldsymbol{l}_{n}+d_{n n} .	$\boldsymbol{a}_{n}=\boldsymbol{L}_{n-1} \boldsymbol{D}_{n-1} \boldsymbol{l}_{n}, \quad a_{n n}=\boldsymbol{l}_{n}^{*} \boldsymbol{D}_{n-1} \boldsymbol{l}_{n}+d_{n n} .$	$\boldsymbol{a}_{n}=\boldsymbol{L}_{n-1} \boldsymbol{D}_{n-1} \boldsymbol{l}_{n}, \quad a_{n n}=\boldsymbol{l}_{n}^{*} \boldsymbol{D}_{n-1} \boldsymbol{l}_{n}+d_{n n} .$
lyche-numerical-linear-algebra_EQ0849	295	0.636	\begin{aligned} \boldsymbol{r}_{k+1}^{T} \boldsymbol{r}_{j} & \stackrel{(13.13)}{=}\left(\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{A} \boldsymbol{p}_{k}\right)^{T} \boldsymbol{r}_{j} \ \ & \stackrel{(13.11)}{=} \boldsymbol{r}_{k}^{T} \boldsymbol{r}_{j}-\alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{A}\left(\boldsymbol{p}_{j}+\sum_{i=0}^{j-1} \left(\frac{\boldsymbol{r}_{j}^{T} \boldsymbol{A} \boldsymbol{p}_{i}}{\boldsymbol{p}_{i}^{T} \boldsymbol{A} \boldsymbol{p}_{i}}\right) \boldsymbol{p}_{i}\right) \ \ & \stackrel{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{i}=0}{=} \boldsymbol{r}_{k}^{T} \boldsymbol{r}_{j}-\alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{j}=0, \quad j=0,1, \ldots, k . \end{aligned}	$\begin{aligned} \boldsymbol{r}_{k+1}^{T} \boldsymbol{r}_{j} & \stackrel{(13.13)}{=}\left(\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{A} \boldsymbol{p}_{k}\right)^{T} \boldsymbol{r}_{j} \ \ & \stackrel{(13.11)}{=} \boldsymbol{r}_{k}^{T} \boldsymbol{r}_{j}-\alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{A}\left(\boldsymbol{p}_{j}+\sum_{i=0}^{j-1} \left(\frac{\boldsymbol{r}_{j}^{T} \boldsymbol{A} \boldsymbol{p}_{i}}{\boldsymbol{p}_{i}^{T} \boldsymbol{A} \boldsymbol{p}_{i}}\right) \boldsymbol{p}_{i}\right) \ \ & \stackrel{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{i}=0}{=} \boldsymbol{r}_{k}^{T} \boldsymbol{r}_{j}-\alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{j}=0, \quad j=0,1, \ldots, k . \end{aligned}$	$\begin{aligned} \boldsymbol{r}_{k+1}^{T} \boldsymbol{r}_{j} & \stackrel{(13.13)}{=}\left(\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{A} \boldsymbol{p}_{k}\right)^{T} \boldsymbol{r}_{j} \ \ & \stackrel{(13.11)}{=} \boldsymbol{r}_{k}^{T} \boldsymbol{r}_{j}-\alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{A}\left(\boldsymbol{p}_{j}+\sum_{i=0}^{j-1} \left(\frac{\boldsymbol{r}_{j}^{T} \boldsymbol{A} \boldsymbol{p}_{i}}{\boldsymbol{p}_{i}^{T} \boldsymbol{A} \boldsymbol{p}_{i}}\right) \boldsymbol{p}_{i}\right) \ \ & \stackrel{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{i}=0}{=} \boldsymbol{r}_{k}^{T} \boldsymbol{r}_{j}-\alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{j}=0, \quad j=0,1, \ldots, k . \end{aligned}$
lyche-numerical-linear-algebra_EQ0592 (9.4)	218	0.637	\mathbb{C}^{m}=\mathcal{R}(\boldsymbol{A}) \stackrel{\perp}{\oplus} \mathcal{N}\left(\boldsymbol{A}^{*}\right) .	$\mathbb{C}^{m}=\mathcal{R}(\boldsymbol{A}) \stackrel{\perp}{\oplus} \mathcal{N}\left(\boldsymbol{A}^{*}\right) .$	$\mathbb{C}^{m}=\mathcal{R}(\boldsymbol{A}) \stackrel{\perp}{\oplus} \mathcal{N}\left(\boldsymbol{A}^{*}\right) .$
lyche-numerical-linear-algebra_EQ0553 (8.42)	208	0.638	\operatorname{cond}_{1}(\boldsymbol{T})= \operatorname{cond}_{\infty}(\boldsymbol{T})=\frac{1}{2} \begin{cases}h^{-2}, & m \text { odd } \\ h^{-2}-1, & m \text { even }\end{cases}	$\operatorname{cond}_{1}(\boldsymbol{T})=\operatorname{cond}_{\infty}(\boldsymbol{T})=\frac{1}{2} \begin{cases}h^{-2}, & m \text { odd } \\ h^{-2}-1, & m \text { even }\end{cases}$	$\operatorname{cond}_{1}(\boldsymbol{T})=\operatorname{cond}_{\infty}(\boldsymbol{T})=\frac{1}{2} \begin{cases}h^{-2}, & m \text { odd, } \\ h^{-2}-1, & m \text { even. }\end{cases}$

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lyche-numerical-linear-algebra_EQ1032	349	0.642	`\begin{aligned} \text { (i) } & \left(\boldsymbol{A}-s_{k-1} \boldsymbol{I}\right) \boldsymbol{y}_{k}=\boldsymbol{x}_{k-1}, \\ \text { (ii) } & \boldsymbol{x}_{k}=\boldsymbol{y}_{k} / \left|\boldsymbol{y}_{k}\right|, \\ \text { (iii) } & \boldsymbol{s}_{k}=\boldsymbol{x}_{k}^{*} \boldsymbol{A} \boldsymbol{x}_{k}, \\ \text { (iv) } & \boldsymbol{r}_{k}=\boldsymbol{A} \boldsymbol{x}_{k}-s_{k} \boldsymbol{x}_{k} . \end{aligned}`	$\begin{aligned} \text { (i) } & \left(\boldsymbol{A}-s_{k-1} \boldsymbol{I}\right) \boldsymbol{y}_{k}=\boldsymbol{x}_{k-1}, \\ \text { (ii) } & \boldsymbol{x}_{k}=\boldsymbol{y}_{k} / \left\|\boldsymbol{y}_{k}\right\|, \\ \text { (iii) } & \boldsymbol{s}_{k}=\boldsymbol{x}_{k}^{*} \boldsymbol{A} \boldsymbol{x}_{k}, \\ \text { (iv) } & \boldsymbol{r}_{k}=\boldsymbol{A} \boldsymbol{x}_{k}-s_{k} \boldsymbol{x}_{k} . \end{aligned}$	$\begin{aligned} (i) \quad & (\boldsymbol{A}-s_{k-1} \boldsymbol{I}) \boldsymbol{y}_{k}=\boldsymbol{x}_{k-1}, \\ (ii) \quad & \boldsymbol{x}_{k}=\boldsymbol{y}_{k} / \|\boldsymbol{y}_{k}\|, \\ (iii) \quad & \boldsymbol{s}_{k}=\boldsymbol{x}_{k}^{*} \boldsymbol{A} \boldsymbol{x}_{k}, \\ (iv) \quad & \boldsymbol{r}_{k}=\boldsymbol{A} \boldsymbol{x}_{k}-s_{k} \boldsymbol{x}_{k} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0698	250	0.645	`\begin{aligned} \boldsymbol{A} & =\left[\begin{array}{rrr|rrr|rrr} 4 & -1 & 0 & -1 & 0 & 0 & 0 & 0 & 0 \\ -1 & 4 & -1 & 0 & -1 & 0 & 0 & 0 & 0 \\ 0 & -1 & 4 & 0 & 0 & -1 & 0 & 0 & 0 \\ \hline -1 & 0 & 0 & 4 & -1 & 0 & -1 & 0 & 0 \\ 0 & -1 & 0 & -1 & 4 & -1 & 0 & -1 & 0 \\ 0 & 0 & -1 & 0 & -1 & 4 & 0 & 0 & -1 \\ \hline 0 & 0 & 0 & -1 & 0 & 0 & 4 & -1 & 0 \\ 0 & 0 & 0 & 0 & -1 & 0 & -1 & 4 & -1 \\ 0 & 0 & 0 & 0 & 0 & -1 & 0-1 & 4 & \end{array}\right] \\ & =\left[\begin{array}{ccc} \boldsymbol{T}+2 \boldsymbol{I} & -\boldsymbol{I} & \mathbf{0} \\ -\boldsymbol{I} & \boldsymbol{T}+2 \boldsymbol{I} & -\boldsymbol{I} \\ \mathbf{0} & -\boldsymbol{I} & \boldsymbol{T}+2 \boldsymbol{I} \end{array}\right], \end{aligned}`	$\begin{aligned} \boldsymbol{A} & =\left[\begin{array}{rrr\|rrr\|rrr} 4 & -1 & 0 & -1 & 0 & 0 & 0 & 0 & 0 \\ -1 & 4 & -1 & 0 & -1 & 0 & 0 & 0 & 0 \\ 0 & -1 & 4 & 0 & 0 & -1 & 0 & 0 & 0 \\ \hline -1 & 0 & 0 & 4 & -1 & 0 & -1 & 0 & 0 \\ 0 & -1 & 0 & -1 & 4 & -1 & 0 & -1 & 0 \\ 0 & 0 & -1 & 0 & -1 & 4 & 0 & 0 & -1 \\ \hline 0 & 0 & 0 & -1 & 0 & 0 & 4 & -1 & 0 \\ 0 & 0 & 0 & 0 & -1 & 0 & -1 & 4 & -1 \\ 0 & 0 & 0 & 0 & 0 & -1 & 0-1 & 4 & \end{array}\right] \\ & =\left[\begin{array}{ccc} \boldsymbol{T}+2 \boldsymbol{I} & -\boldsymbol{I} & \mathbf{0} \\ -\boldsymbol{I} & \boldsymbol{T}+2 \boldsymbol{I} & -\boldsymbol{I} \\ \mathbf{0} & -\boldsymbol{I} & \boldsymbol{T}+2 \boldsymbol{I} \end{array}\right], \end{aligned}$	$\begin{aligned} \boldsymbol{A} & =\left[\begin{array}{rrr\|rrr\|rrr} 4 & -1 & 0 & -1 & 0 & 0 & 0 & 0 & 0 \\ -1 & 4 & -1 & 0 & -1 & 0 & 0 & 0 & 0 \\ 0 & -1 & 4 & 0 & 0 & -1 & 0 & 0 & 0 \\ \hline -1 & 0 & 0 & 4 & -1 & 0 & -1 & 0 & 0 \\ 0 & -1 & 0 & -1 & 4 & -1 & 0 & -1 & 0 \\ 0 & 0 & -1 & 0 & -1 & 4 & 0 & 0 & -1 \\ \hline 0 & 0 & 0 & -1 & 0 & 0 & 4 & -1 & 0 \\ 0 & 0 & 0 & 0 & -1 & 0 & -1 & 4 & -1 \\ 0 & 0 & 0 & 0 & 0 & -1 & 0-1 & 4 & \end{array}\right] \\ & =\left[\begin{array}{ccc} \boldsymbol{T}+2 \boldsymbol{I} & -\boldsymbol{I} & \mathbf{0} \\ -\boldsymbol{I} & \boldsymbol{T}+2 \boldsymbol{I} & -\boldsymbol{I} \\ \mathbf{0} & -\boldsymbol{I} & \boldsymbol{T}+2 \boldsymbol{I} \end{array}\right], \end{aligned}$
lyche-numerical-linear-algebra_EQ0641	232	0.645	`r=r(x)=b-A x .`	$r=r(x)=b-Ax.$	$\boldsymbol{r}=\boldsymbol{r}(\boldsymbol{x})=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}.$
lyche-numerical-linear-algebra_EQ0601 (9.7)	222	0.650	`\boldsymbol{A}=\boldsymbol{U} \boldsymbol{\Sigma} \boldsymbol{V}^{*}=\left[\boldsymbol{U}_{1}, \boldsymbol{U}_{2}\right]\left[\begin{array}{cc} \boldsymbol{\Sigma}_{1} & \mathbf{0} \\ \mathbf{0} & \mathbf{0} \end{array}\right]\left[\begin{array}{l} \boldsymbol{V}_{1}^{*} \\ \boldsymbol{V}_{2}^{*} \end{array}\right]=\boldsymbol{U}_{1} \boldsymbol{\Sigma}_{1} \boldsymbol{V}_{1}^{*}, \quad \boldsymbol{\Sigma}_{1}=\operatorname{diag}\left(\sigma_{1}, \ldots, \sigma_{r}\right),`	$\boldsymbol{A}=\boldsymbol{U} \boldsymbol{\Sigma} \boldsymbol{V}^{*}=\left[\boldsymbol{U}_{1}, \boldsymbol{U}_{2}\right]\left[\begin{array}{cc} \boldsymbol{\Sigma}_{1} & \mathbf{0} \\ \mathbf{0} & \mathbf{0} \end{array}\right]\left[\begin{array}{l} \boldsymbol{V}_{1}^{*} \\ \boldsymbol{V}_{2}^{*} \end{array}\right]=\boldsymbol{U}_{1} \boldsymbol{\Sigma}_{1} \boldsymbol{V}_{1}^{*}, \quad \boldsymbol{\Sigma}_{1}=\operatorname{diag}\left(\sigma_{1}, \ldots, \sigma_{r}\right),$	$\boldsymbol{A}=\boldsymbol{U} \boldsymbol{\Sigma} \boldsymbol{V}^{*}=\left[\boldsymbol{U}_{1}, \boldsymbol{U}_{2}\right]\left[\begin{array}{cc} \Sigma_{1} & \mathbf{0} \\ \mathbf{0} & \mathbf{0} \end{array}\right]\left[\begin{array}{l} \boldsymbol{V}_{1}^{*} \\ \boldsymbol{V}_{2}^{*} \end{array}\right]=\boldsymbol{U}_{1} \boldsymbol{\Sigma}_{1} \boldsymbol{V}_{1}^{*}, \quad \Sigma_{1}=\operatorname{diag}(\sigma_{1}, \ldots, \sigma_{r}),$
lyche-numerical-linear-algebra_EQ0201 (3.11)	85	0.651	`\boldsymbol{p}:=\boldsymbol{p}_{n}, \text { where } \boldsymbol{p}_{1}:=[1,2, \ldots, n]^{T}, \text { and } \boldsymbol{p}_{k+1}:=\boldsymbol{I}_{r_{k}, k} \boldsymbol{p}_{k} \text { for } k=1, \ldots, n-1 .`	$\boldsymbol{p}:=\boldsymbol{p}_{n}, \text { where } \boldsymbol{p}_{1}:=[1,2, \ldots, n]^{T}, \text { and } \boldsymbol{p}_{k+1}:=\boldsymbol{I}_{r_{k}, k} \boldsymbol{p}_{k} \text { for } k=1, \ldots, n-1.$	$\boldsymbol{p}:=\boldsymbol{p}_{n}, \text { where } \boldsymbol{p}_{1}:=[1,2, \ldots, n]^{T}, \text { and } \boldsymbol{p}_{k+1}:=\boldsymbol{I}_{r_{k}, k} \boldsymbol{p}_{k} \text { for } k=1, \ldots, n-1.$

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lyche-numerical-linear-algebra_ EQ0947	320	0.654	\begin{aligned} & {\left[\boldsymbol{x}_{0}, \boldsymbol{x}_{1}, \boldsymbol{x}_{2}, \boldsymbol{x}_{3}\right]=\left[\begin{array}{rrrr} 0 & 2 & 8 / 3 & 3 \\ 0 & 0 & 4 / 3 & 2 \\ 0 & 0 & 0 & 1 \end{array}\right],} \\ & {\left[\boldsymbol{r}_{0}, \boldsymbol{r}_{1}, \boldsymbol{r}_{2}, \boldsymbol{r}_{3}\right]=\left[\begin{array}{rrrr} 4 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 \\ 0 & 0 & 4 / 3 & 0 \end{array}\right],} \end{aligned}	$$\begin{aligned} & {\left[\boldsymbol{x}_{0}, \boldsymbol{x}_{1}, \boldsymbol{x}_{2}, \boldsymbol{x}_{3}\right]=\left[\begin{array}{rrrr} 0 & 2 & 8 / 3 & 3 \\ 0 & 0 & 4 / 3 & 2 \\ 0 & 0 & 0 & 1 \end{array}\right],} \\ & {\left[\boldsymbol{r}_{0}, \boldsymbol{r}_{1}, \boldsymbol{r}_{2}, \boldsymbol{r}_{3}\right]=\left[\begin{array}{rrrr} 4 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 \\ 0 & 0 & 4 / 3 & 0 \end{array}\right],} \end{aligned}$$	$$\begin{aligned} & {\left[\boldsymbol{x}_{0}, \boldsymbol{x}_{1}, \boldsymbol{x}_{2}, \boldsymbol{x}_{3}\right]=\left[\begin{array}{rrrr} 0 & 2 & 8 / 3 & 3 \\ 0 & 0 & 4 / 3 & 2 \\ 0 & 0 & 0 & 1 \end{array}\right],} \\ & {\left[\boldsymbol{r}_{0}, \boldsymbol{r}_{1}, \boldsymbol{r}_{2}, \boldsymbol{r}_{3}\right]=\left[\begin{array}{rrrr} 4 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 \\ 0 & 0 & 4 / 3 & 0 \end{array}\right],} \end{aligned}$$
lyche-numerical-linear-algebra_ EQ0415	166	0.666	R(\boldsymbol{x}-t \boldsymbol{y})=R(\boldsymbol{x})-2 t(\boldsymbol{A x}-R(\boldsymbol{x}) \boldsymbol{x})^{T} \boldsymbol{y}+\mathcal{O}\left(t^{2}\right),	$$R(\boldsymbol{x}-t \boldsymbol{y})=R(\boldsymbol{x})-2 t(\boldsymbol{A x}-R(\boldsymbol{x}) \boldsymbol{x})^{T} \boldsymbol{y}+\mathcal{O}\left(t^{2}\right),$$	$$R(\boldsymbol{x}-t \boldsymbol{y})=R(\boldsymbol{x})-2 t(\boldsymbol{A x}-R(\boldsymbol{x}) \boldsymbol{x})^{T} \boldsymbol{y}+\mathcal{O}\left(t^{2}\right),$$
lyche-numerical-linear-algebra_ EQ0602	222	0.667	\begin{array}{ll} \boldsymbol{U}_{1}=\left[\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{r}\right], & \boldsymbol{U}_{2}=\left[\boldsymbol{u}_{r+1}, \ldots, \boldsymbol{u}_{m}\right], \\ \boldsymbol{V}_{1}=\left[\boldsymbol{v}_{1}, \ldots, \boldsymbol{v}_{r}^{*}\right], & \boldsymbol{V}_{2}=\left[\boldsymbol{v}_{r+1}, \ldots, \boldsymbol{v}_{n}\right], \end{array} \quad \boldsymbol{V}_{1}^{*} \boldsymbol{V}_{1}=\boldsymbol{I}, \quad \boldsymbol{V}_{2}^{*} \boldsymbol{V}_{2}=\boldsymbol{I},	$$\begin{array}{ll} \boldsymbol{U}_{1}=\left[\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{r}\right], & \boldsymbol{U}_{2}=\left[\boldsymbol{u}_{r+1}, \ldots, \boldsymbol{u}_{m}\right], \\ \boldsymbol{V}_{1}=\left[\boldsymbol{v}_{1}, \ldots, \boldsymbol{v}_{r}^{*}\right], & \boldsymbol{V}_{2}=\left[\boldsymbol{v}_{r+1}, \ldots, \boldsymbol{v}_{n}\right], \end{array} \quad \boldsymbol{V}_{1}^{*} \boldsymbol{V}_{1}=\boldsymbol{I}, \quad \boldsymbol{V}_{2}^{*} \boldsymbol{V}_{2}=\boldsymbol{I},$$	$$\begin{array}{lll} \boldsymbol{U}_{1}=\left[\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{r}\right], & \boldsymbol{U}_{2}=\left[\boldsymbol{u}_{r+1}, \ldots, \boldsymbol{u}_{m}\right], & \boldsymbol{U}_{1}^{*} \boldsymbol{U}_{1}=\boldsymbol{I}, \ \boldsymbol{U}_{2}^{*} \boldsymbol{U}_{2}=\boldsymbol{I}, \\ \boldsymbol{V}_{1}=\left[\boldsymbol{v}_{1}, \ldots, \boldsymbol{v}_{r}\right], & \boldsymbol{V}_{2}=\left[\boldsymbol{v}_{r+1}, \ldots, \boldsymbol{v}_{n}\right], & \boldsymbol{V}_{1}^{*} \boldsymbol{V}_{1}=\boldsymbol{I}, \ \boldsymbol{V}_{2}^{*} \boldsymbol{V}_{2}=\boldsymbol{I} \end{array}$$
lyche-numerical-linear-algebra_ EQ0751	267	0.670	\begin{array}{r} J: \boldsymbol{v}_{k+1}(i, j)=\left(\boldsymbol{v}_{k}(i-1, j)+\boldsymbol{v}_{k}(i, j-1)+\boldsymbol{v}_{k}(i+1, j)+\boldsymbol{v}_{k}(i, j+1)\right. \\ +\boldsymbol{e}(i, j)) / 4 \\ G S: \boldsymbol{v}_{k+1}(i, j)=\left(\boldsymbol{v}_{k+1}(i-1, j)+\boldsymbol{v}_{k+1}(i, j-1)+\boldsymbol{v}_{k}(i+1, j)+\boldsymbol{v}_{k}(i, j+1)\right. \\ +\boldsymbol{e}(i, j)) / 4 \end{array}	$$\begin{array}{r} J: \boldsymbol{v}_{k+1}(i, j)=\left(\boldsymbol{v}_{k}(i-1, j)+\boldsymbol{v}_{k}(i, j-1)+\boldsymbol{v}_{k}(i+1, j)+\boldsymbol{v}_{k}(i, j+1)\right. \\ +\boldsymbol{e}(i, j)) / 4 \\ G S: \boldsymbol{v}_{k+1}(i, j)=\left(\boldsymbol{v}_{k+1}(i-1, j)+\boldsymbol{v}_{k+1}(i, j-1)+\boldsymbol{v}_{k}(i+1, j)+\boldsymbol{v}_{k}(i, j+1)\right. \\ +\boldsymbol{e}(i, j)) / 4 \end{array}$$	$$\begin{array}{r} J: \boldsymbol{v}_{k+1}(i, j)=\left(\boldsymbol{v}_{k}(i-1, j)+\boldsymbol{v}_{k}(i, j-1)+\boldsymbol{v}_{k}(i+1, j)+\boldsymbol{v}_{k}(i, j+1)\right. \\ +\boldsymbol{e}(i, j)) / 4 \\ G S: \boldsymbol{v}_{k+1}(i, j)=\left(\boldsymbol{v}_{k+1}(i-1, j)+\boldsymbol{v}_{k+1}(i, j-1)+\boldsymbol{v}_{k}(i+1, j)+\boldsymbol{v}_{k}(i, j+1)\right. \\ +\boldsymbol{e}(i, j)) / 4 \end{array}$$
lyche-numerical-linear-algebra_ EQ0190 (3.8)	80	0.672	x_{k}=\left(b_{k}-\sum_{j=l_{k}}^{k-1} a_{k, j} x_{j} \right) / a_{k k}, \quad k=1,2, \ldots, n .	$$x_{k}=\left(b_{k}-\sum_{j=l_{k}}^{k-1} a_{k, j} x_{j} \right) / a_{k k}, \quad k=1,2, \ldots, n .$$	$$x_{k}=\left(b_{k}-\sum_{j=l_{k}}^{k-1} a_{k, j} x_{j} \right) / a_{k k}, \quad k=1,2, \ldots, n .$$

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lyche-numerical-linear-algebra_EQ0719	257	0.674	`\begin{aligned} \left(\boldsymbol{F}_{2 m+2} \boldsymbol{z}\right)_{k+1} & =\sum_{j=0}^{2 m-1} \omega^{j k} z_{j+1}=\sum_{j=1}^{m} x_{j} \omega^{j k}-\sum_{j=1}^{m} x_{j} \omega^{(2 m+2-j) k} \\ & =\sum_{j=1}^{m} x_{j}\left(e^{-\pi i j k /(m+1)}-e^{\pi i j k /(m+1)}\right) \\ & =-2 i \sum_{j=1}^{m} x_{j} \sin \left(\frac{j k \pi}{m+1}\right)=-2 i \left(\boldsymbol{S}_{m} \boldsymbol{x}\right)_{k} . \end{aligned}`	$$\begin{aligned} \left(\boldsymbol{F}_{2 m+2} \boldsymbol{z}\right)_{k+1} & =\sum_{j=0}^{2 m-1} \omega^{j k} z_{j+1}=\sum_{j=1}^{m} x_{j} \omega^{j k}-\sum_{j=1}^{m} x_{j} \omega^{(2 m+2-j) k} \\ & =\sum_{j=1}^{m} x_{j}\left(e^{-\pi i j k /(m+1)}-e^{\pi i j k /(m+1)}\right) \\ & =-2 i \sum_{j=1}^{m} x_{j} \sin \left(\frac{j k \pi}{m+1}\right)=-2 i \left(\boldsymbol{S}_{m} \boldsymbol{x}\right)_{k} . \end{aligned}$$	$$\begin{aligned} \left(\boldsymbol{F}_{2 m+2} \boldsymbol{z}\right)_{k+1} & =\sum_{j=0}^{2 m-1} \omega^{j k} z_{j+1}=\sum_{j=1}^{m} x_{j} \omega^{j k}-\sum_{j=1}^{m} x_{j} \omega^{(2 m+2-j) k} \\ & =\sum_{j=1}^{m} x_{j}\left(e^{-\pi i j k /(m+1)}-e^{\pi i j k /(m+1)}\right) \\ & =-2 i \sum_{j=1}^{m} x_{j} \sin \left(\frac{j k \pi}{m+1}\right)=-2 i \left(\boldsymbol{S}_{m} \boldsymbol{x}\right)_{k} . \end{aligned}$$
lyche-numerical-linear-algebra_EQ0599	221	0.676	`\boldsymbol{A}=\left[\begin{array}{ccc} 1 & 3 & 1 \\ 1 & 3 & 7 \\ 1 & -1 & -4 \\ 1 & -1 & 2 \end{array}\right] \text { and } \boldsymbol{b}=\left[\begin{array}{l} 1 \\ 1 \\ 1 \\ 1 \end{array}\right] .`	$$\boldsymbol{A}=\left[\begin{array}{ccc} 1 & 3 & 1 \\ 1 & 3 & 7 \\ 1 & -1 & -4 \\ 1 & -1 & 2 \end{array}\right] \text { and } \boldsymbol{b}=\left[\begin{array}{l} 1 \\ 1 \\ 1 \\ 1 \end{array}\right] .$$	$$\boldsymbol{A}=\left[\begin{array}{ccc} 1 & 3 & 1 \\ 1 & 3 & 7 \\ 1 & -1 & -4 \\ 1 & -1 & 2 \end{array}\right] \text { and } \boldsymbol{b}=\left[\begin{array}{l} 1 \\ 1 \\ 1 \\ 1 \end{array}\right] .$$
lyche-numerical-linear-algebra_EQ0726 (11.7)	258	0.678	`\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}= \left[\begin{array}{c|c} \boldsymbol{F}_{m} & \boldsymbol{D}_{m} \boldsymbol{F}_{m} \\ \hline \boldsymbol{F}_{m} & -\boldsymbol{D}_{m} \boldsymbol{F}_{m} \end{array}\right],`	$$\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}=\left[\begin{array}{c\|c} \boldsymbol{F}_{m} & \boldsymbol{D}_{m} \boldsymbol{F}_{m} \\ \hline \boldsymbol{F}_{m} & -\boldsymbol{D}_{m} \boldsymbol{F}_{m} \end{array}\right],$$	$$\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m}=\left[\begin{array}{c\|c} \boldsymbol{F}_{m} & \boldsymbol{D}_{m} \boldsymbol{F}_{m} \\ \hline \boldsymbol{F}_{m} & -\boldsymbol{D}_{m} \boldsymbol{F}_{m} \end{array}\right],$$
lyche-numerical-linear-algebra_EQ0513	200	0.679	`\begin{aligned} f(x) & =\frac{x_{2}-x}{x_{2}-x_{1}} f\left(x_{1}\right)+\frac{x-x_{1}}{x_{2}-x_{1}} f \left(x_{2}\right)+\left(x-x_{1}\right)\left(x-x_{2} \right) f^{\prime \prime}(c) / 2 \\ & =(1-\lambda) f\left(x_{1}\right)+\lambda f\left(x_{2}\right)+\left(x_{2}-x_{1}\right)^{2} \lambda(\lambda-1) f^{\prime \prime}(c) / 2, \quad \lambda:= \frac{x-x_{1}}{x_{2}-x_{1}} \end{aligned}`	$$\begin{aligned} f(x) & =\frac{x_{2}-x}{x_{2}-x_{1}} f\left(x_{1}\right)+\frac{x-x_{1}}{x_{2}-x_{1}} f \left(x_{2}\right)+\left(x-x_{1}\right)\left(x-x_{2} \right) f^{\prime \prime}(c) / 2 \\ & =(1-\lambda) f\left(x_{1}\right)+\lambda f\left(x_{2}\right)+\left(x_{2}-x_{1}\right)^{2} \lambda(\lambda-1) f^{\prime \prime}(c) / 2, \quad \lambda:= \frac{x-x_{1}}{x_{2}-x_{1}} \end{aligned}$$	$$\begin{aligned} f(x) & =\frac{x_{2}-x}{x_{2}-x_{1}} f\left(x_{1}\right)+\frac{x-x_{1}}{x_{2}-x_{1}} f \left(x_{2}\right)+\left(x-x_{1}\right)\left(x-x_{2} \right) f^{\prime \prime}(c) / 2 \\ & =(1-\lambda) f\left(x_{1}\right)+\lambda f\left(x_{2}\right)+\left(x_{2}-x_{1}\right)^{2} \lambda(\lambda-1) f^{\prime \prime}(c) / 2, \quad \lambda:= \frac{x-x_{1}}{x_{2}-x_{1}} \end{aligned}$$
lyche-numerical-linear-algebra_EQ0607	222	0.679	`\begin{aligned} A A^{\dagger} A & =U_{1} \Sigma_{1} V_{1}^{*} V_{1} V_{1}^{*}=U_{1} \Sigma_{1} V_{1}^{*}=A \\ A^{\dagger} A A^{\dagger} & =V_{1} \Sigma_{1}^{-1} U_{1}^{*} U_{1} U_{1}^{*}=V_{1} \Sigma^{-1} U_{1}^{*}=A^{ \dagger} \end{aligned}`	$$\begin{aligned} A A^{\dagger} A & =U_{1} \Sigma_{1} V_{1}^{*} V_{1} V_{1}^{*}=U_{1} \Sigma_{1} V_{1}^{*}=A \\ A^{\dagger} A A^{\dagger} & =V_{1} \Sigma_{1}^{-1} U_{1}^{*} U_{1} U_{1}^{*}=V_{1} \Sigma^{-1} U_{1}^{*}=A^{ \dagger} \end{aligned}$$	$$\begin{aligned} A A^{\dagger} A & =U_{1} \Sigma_{1} V_{1}^{*} V_{1} V_{1}^{*}=U_{1} \Sigma_{1} V_{1}^{*}=A \\ A^{\dagger} A A^{\dagger} & =V_{1} \Sigma_{1}^{-1} U_{1}^{*} U_{1} U_{1}^{*}=V_{1} \Sigma^{-1} U_{1}^{*}=A^{ \dagger} \end{aligned}$$
lyche-numerical-linear-algebra_EQ0038	35	0.682	`\begin{aligned} &\left|\begin{array}{lll} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{array}\right|=a_{11} a_{22} a_{33}-a_{11} a_{32} a_{23}-a_{21} a_{12} a_{33} \\ &+a_{21} a_{32} a_{13}+a_{31} a_{12} a_{23}-a_{31} a_{22} a_{13} \end{aligned}`	$$\begin{aligned} &\left\|\begin{array}{lll} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{array}\right\|=a_{11} a_{22} a_{33}-a_{11} a_{32} a_{23}-a_{21} a_{12} a_{33} \\ &+a_{21} a_{32} a_{13}+a_{31} a_{12} a_{23}-a_{31} a_{22} a_{13} \end{aligned}$$	$$\begin{aligned} &\left\|\begin{array}{lll} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{array}\right\|=a_{11} a_{22} a_{33}-a_{11} a_{32} a_{23}-a_{21} a_{12} a_{33} \\ &+a_{21} a_{32} a_{13}+a_{31} a_{12} a_{23}-a_{31} a_{22} a_{13} \end{aligned}$$

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lyche-numerical-linear-algebra_EQ0383	155	0.685	`R(x)=R_{A}(x):=\frac{x^{*} A x}{x^{*} x}`	$R(x)=R_{A}(x):=\frac{x^{*} A x}{x^{*} x}$	$R(\boldsymbol{x})=R_{\boldsymbol{A}}(\boldsymbol{x}):=\frac{\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}}{\boldsymbol{x}^{*} \boldsymbol{x}}$
lyche-numerical-linear-algebra_EQ0578	214	0.686	`c_{1}\left[\begin{array}{c} 1 \\ \vdots \\ 1 \end{array}\right]+c_{2}\left[\begin{array}{c} t_{1} \\ \vdots \\ t_{m} \end{array}\right]=\left[\begin{array}{c} 0 \\ \vdots \\ 0 \end{array}\right] \Longrightarrow\left[\begin{array}{cc} 1 & t_{i} \\ 1 & t_{j} \end{array}\right]\left[\begin{array}{c} c_{1} \\ c_{2} \end{array}\right]=\left[\begin{array}{c} 0 \\ 0 \end{array}\right] \Longrightarrow c_{1}=c_{2}=0 .`	$c_{1}\left[\begin{array}{c} 1 \\ \vdots \\ 1 \end{array}\right]+c_{2}\left[\begin{array}{c} t_{1} \\ \vdots \\ t_{m} \end{array}\right]=\left[\begin{array}{c} 0 \\ \vdots \\ 0 \end{array}\right] \Longrightarrow\left[\begin{array}{cc} 1 & t_{i} \\ 1 & t_{j} \end{array}\right]\left[\begin{array}{c} c_{1} \\ c_{2} \end{array}\right]=\left[\begin{array}{c} 0 \\ 0 \end{array}\right] \Longrightarrow c_{1}=c_{2}=0 .$	$c_{1}\left[\begin{array}{c} 1 \\ \vdots \\ 1 \end{array}\right]+c_{2}\left[\begin{array}{c} t_{1} \\ \vdots \\ t_{m} \end{array}\right]=\left[\begin{array}{c} 0 \\ \vdots \\ 0 \end{array}\right] \Longrightarrow\left[\begin{array}{cc} 1 & t_{i} \\ 1 & t_{j} \end{array}\right]\left[\begin{array}{c} c_{1} \\ c_{2} \end{array}\right]=\left[\begin{array}{c} 0 \\ 0 \end{array}\right] \Longrightarrow c_{1}=c_{2}=0 .$
lyche-numerical-linear-algebra_EQ0535	203	0.693	`a_{n}\langle\boldsymbol{x}, \boldsymbol{y}\rangle=\left \langle a_{n} \boldsymbol{x}, \boldsymbol{y}\right\rangle \stackrel{(8.36)}{=} \frac{1}{4}\left(\left\\|a_{n} \boldsymbol{x}+\boldsymbol{y}\right\\|^{2}-\left\\|a_{n} \boldsymbol{x}-\boldsymbol{y}\right\\|^{2}\right) .`	$a_{n}\langle\boldsymbol{x}, \boldsymbol{y}\rangle=\langle a_{n} \boldsymbol{x}, \boldsymbol{y}\rangle \stackrel{(8.36)}{=} \frac{1}{4}\left(\left\\|a_{n} \boldsymbol{x}+\boldsymbol{y}\right\\|^{2}-\left\\|a_{n} \boldsymbol{x}-\boldsymbol{y}\right\\|^{2}\right) .$	$a_{n}\langle\boldsymbol{x}, \boldsymbol{y}\rangle=\langle a_{n} \boldsymbol{x}, \boldsymbol{y}\rangle \stackrel{(8.36)}{=} \frac{1}{4}\left(\left\\|a_{n} \boldsymbol{x}+\boldsymbol{y}\right\\|^{2}-\left\\|a_{n} \boldsymbol{x}-\boldsymbol{y}\right\\|^{2}\right) .$
lyche-numerical-linear-algebra_EQ1026	347	0.696	`\left[\begin{array}{c} \boldsymbol{u}^{*} \\ \boldsymbol{U}^{*} \end{array}\right](\boldsymbol{A} \boldsymbol{u}-\lambda \boldsymbol{u})=\left[\begin{array}{c} \boldsymbol{u}^{*} \boldsymbol{A} \boldsymbol{u}-\lambda \boldsymbol{u}^{*} \boldsymbol{u} \\ \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{u}-\lambda \boldsymbol{U}^{*} \boldsymbol{u} \end{array} \right]=\left[\begin{array}{c} \boldsymbol{u}^{*} \boldsymbol{A} \boldsymbol{u}-\lambda \\ \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{u} \end{array}\right] .`	$\left[\begin{array}{c} \boldsymbol{u}^{*} \\ \boldsymbol{U}^{*} \end{array}\right](\boldsymbol{A} \boldsymbol{u}-\lambda \boldsymbol{u})=\left[\begin{array}{c} \boldsymbol{u}^{*} \boldsymbol{A} \boldsymbol{u}-\lambda \boldsymbol{u}^{*} \boldsymbol{u} \\ \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{u}-\lambda \boldsymbol{U}^{*} \boldsymbol{u} \end{array} \right]=\left[\begin{array}{c} \boldsymbol{u}^{*} \boldsymbol{A} \boldsymbol{u}-\lambda \\ \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{u} \end{array}\right] .$	$\left[\begin{array}{c} \boldsymbol{u}^{*} \\ \boldsymbol{U}^{*} \end{array}\right](\boldsymbol{A} \boldsymbol{u}-\lambda \boldsymbol{u})=\left[\begin{array}{c} \boldsymbol{u}^{*} \boldsymbol{A} \boldsymbol{u}-\lambda \boldsymbol{u}^{*} \boldsymbol{u} \\ \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{u}-\lambda \boldsymbol{U}^{*} \boldsymbol{u} \end{array} \right]=\left[\begin{array}{c} \boldsymbol{u}^{*} \boldsymbol{A} \boldsymbol{u}-\lambda \\ \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{u} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0410 (6.19)	164	0.702	`\mu_{\boldsymbol{A}}(\lambda):=\prod_{i=1}^{k}\left( \lambda_{i}-\lambda\right)^{m_{i}} \text { where } m_{i}:=\max _{1 \leq j \leq g_{i}} m_{i, j} \text {, }`	$\mu_{\boldsymbol{A}}(\lambda):=\prod_{i=1}^{k}\left(\lambda_{i}-\lambda\right)^{m_{i}} \text { where } m_{i}:=\max _{1 \leq j \leq g_{i}} m_{i, j} \text {, }$	$\mu_{\boldsymbol{A}}(\lambda):=\prod_{i=1}^{k}\left(\lambda_{i}-\lambda\right)^{m_{i}} \text { where } m_{i}:=\max _{1 \leq j \leq g_{i}} m_{i, j} \text {, }$
lyche-numerical-linear-algebra_EQ0699 (11.1)	251	0.706	`\left[\begin{array}{cccc} \boldsymbol{D}_{1} & \boldsymbol{C}_{1} & & \\ \boldsymbol{A}_{1} & \boldsymbol{D}_{2} & \boldsymbol{C}_{2} & \\ & \ddots & \ddots & \ddots \\ & & \boldsymbol{A}_{m-2} & \boldsymbol{D}_{m-1} \\ & & \boldsymbol{A}_{m-1} & \boldsymbol{D}_{m} \end{array}\right]=\left[\begin{array}{cccc} \boldsymbol{I} & & & \\ \boldsymbol{L}_{1} & \boldsymbol{I} & & \\ & \ddots & \ddots & \\ & & \boldsymbol{L}_{m-1} & \boldsymbol{I} \end{array}\right]\left[\begin{array}{cccc} \boldsymbol{U}_{1} & \boldsymbol{C}_{1} & & \\ & \ddots & \ddots & \\ & & \boldsymbol{U}_{m-1} & \boldsymbol{C}_{m-1} \\ & & & \boldsymbol{U}_{m} \end{array}\right] .`	$\left[\begin{array}{cccc} \boldsymbol{D}_{1} & \boldsymbol{C}_{1} & & \\ \boldsymbol{A}_{1} & \boldsymbol{D}_{2} & \boldsymbol{C}_{2} & \\ & \ddots & \ddots & \ddots \\ & & \boldsymbol{A}_{m-2} & \boldsymbol{D}_{m-1} \\ & & \boldsymbol{A}_{m-1} & \boldsymbol{D}_{m} \end{array}\right]=\left[\begin{array}{cccc} \boldsymbol{I} & & & \\ \boldsymbol{L}_{1} & \boldsymbol{I} & & \\ & \ddots & \ddots & \\ & & \boldsymbol{L}_{m-1} & \boldsymbol{I} \end{array}\right]\left[\begin{array}{cccc} \boldsymbol{U}_{1} & \boldsymbol{C}_{1} & & \\ & \ddots & \ddots & \\ & & \boldsymbol{U}_{m-1} & \boldsymbol{C}_{m-1} \\ & & & \boldsymbol{U}_{m} \end{array}\right] .$	$\left[\begin{array}{cccc} \boldsymbol{D}_{1} & \boldsymbol{C}_{1} & & \\ \boldsymbol{A}_{1} & \boldsymbol{D}_{2} & \boldsymbol{C}_{2} & \\ & \ddots & \ddots & \ddots \\ & & \boldsymbol{A}_{m-2} & \boldsymbol{D}_{m-1} \\ & & \boldsymbol{A}_{m-1} & \boldsymbol{D}_{m} \end{array}\right]=\left[\begin{array}{cccc} \boldsymbol{I} & & & \\ \boldsymbol{L}_{1} & \boldsymbol{I} & & \\ & \ddots & \ddots & \\ & & \boldsymbol{L}_{m-1} & \boldsymbol{I} \end{array}\right]\left[\begin{array}{cccc} \boldsymbol{U}_{1} & \boldsymbol{C}_{1} & & \\ & \ddots & \ddots & \\ & & \boldsymbol{U}_{m-1} & \boldsymbol{C}_{m-1} \\ & & & \boldsymbol{U}_{m} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0717	256	0.709	`(\boldsymbol{S} \boldsymbol{x})_{k}=\frac{i}{2}\left( \boldsymbol{F}_{2 m+2} \boldsymbol{z}\right)_{k+1}, \quad k=1, \ldots, m .`	$(\boldsymbol{S} \boldsymbol{x})_{k}=\frac{i}{2}\left(\boldsymbol{F}_{2 m+2} \boldsymbol{z}\right)_{k+1}, \quad k=1, \ldots, m .$	$(\boldsymbol{S} \boldsymbol{x})_{k}=\frac{i}{2}\left(\boldsymbol{F}_{2 m+2} \boldsymbol{z}\right)_{k+1}, \quad k=1, \ldots, m .$

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lyche-numerical-linear-algebra_EQ0593	218	0.712	\\|A x-b\\|_{2}^{2}=\left\\|\left(A x-b_{1}\right)-b_{2} \right\\|_{2}^{2}=\left\\|A x-b_{1}\right\\|_{2}^{2}+\left \\|b_{2}\right\\|_{2}^{2} \geq\left\\|b_{2}\right\\|_{2}^{2}	$\\|Ax-b\\|_2^2=\\|(Ax-b_1)-b_2\\|_2^2=\\|Ax-b_1\\|_2^2+\\|b_2\\|_2^2\geq\\|b_2\\|_2^2$	$\\|\boldsymbol{A}\boldsymbol{x}-\boldsymbol{b}\\|_2^2=\\|(\boldsymbol{A}\boldsymbol{x}-\boldsymbol{b}_1)-\boldsymbol{b}_2\\|_2^2=\\|\boldsymbol{A}\boldsymbol{x}-\boldsymbol{b}_1\\|_2^2+\\|\boldsymbol{b}_2\\|_2^2\geq\\|\boldsymbol{b}_2\\|_2^2$
lyche-numerical-linear-algebra_EQ0530 (8.38)	203	0.713	\begin{aligned} & 4\langle x, z\rangle+4\langle y, z \rangle \stackrel{(8.36)}{=}\\|x+z\\|^{2}-\\|x-z\\|^{2}+\\|y+z \\|^{2}-\\|y-z\\|^{2} \\ & =\left\\|\left(z+\frac{x+y}{2} \right)+\frac{x-y}{2}\right\\|^{2}-\left\\|\left(z- \frac{x+y}{2}\right)+\frac{y-x}{2}\right\\|^{2} \\ & + \left\\|\left(z+\frac{x+y}{2}\right)-\frac{x-y}{2}\right \\|^{2}-\left\\|\left(z-\frac{x+y}{2}\right)-\frac{y-x}{2} \right\\|^{2} \\ & \stackrel{(8.35)}{=} 2\left\\|z+ \frac{x+y}{2}\right\\|^{2}+2\left\\|\frac{x-y}{2}\right \\|^{2}-2\left\\|z-\frac{x+y}{2}\right\\|^{2}-2\left\\| \frac{y-x}{2}\right\\|^{2} \\ & \stackrel{(8.36)}{=} 8 \left\langle\frac{x+y}{2}, z\right\rangle \end{aligned}	$\begin{aligned} & 4\langle x, z\rangle+4\langle y, z \rangle \stackrel{(8.36)}{=}\\|x+z\\|^{2}-\\|x-z\\|^{2}+\\|y+z \\|^{2}-\\|y-z\\|^{2} \\ & =\left\\|\left(z+\frac{x+y}{2} \right)+\frac{x-y}{2}\right\\|^{2}-\left\\|\left(z- \frac{x+y}{2}\right)+\frac{y-x}{2}\right\\|^{2} \\ & + \left\\|\left(z+\frac{x+y}{2}\right)-\frac{x-y}{2}\right \\|^{2}-\left\\|\left(z-\frac{x+y}{2}\right)-\frac{y-x}{2} \right\\|^{2} \\ & \stackrel{(8.35)}{=} 2\left\\|z+ \frac{x+y}{2}\right\\|^{2}+2\left\\|\frac{x-y}{2}\right \\|^{2}-2\left\\|z-\frac{x+y}{2}\right\\|^{2}-2\left\\| \frac{y-x}{2}\right\\|^{2} \\ & \stackrel{(8.36)}{=} 8 \left\langle\frac{x+y}{2}, z\right\rangle \end{aligned}$	$\begin{aligned} & 4\langle \boldsymbol{x}, \boldsymbol{z}\rangle+4\langle \boldsymbol{y}, \boldsymbol{z} \rangle \stackrel{(8.36)}{=}\\|\boldsymbol{x}+\boldsymbol{z}\\|^{2}-\\|\boldsymbol{x}-\boldsymbol{z}\\|^{2}+\\|\boldsymbol{y}+\boldsymbol{z}\\|^{2}-\\|\boldsymbol{y}-\boldsymbol{z}\\|^{2} \\ & =\\|\left(\boldsymbol{z}+\frac{\boldsymbol{x}+\boldsymbol{y}}{2} \right)+\frac{\boldsymbol{x}-\boldsymbol{y}}{2}\\|^{2}-\\|\left(\boldsymbol{z}- \frac{\boldsymbol{x}+\boldsymbol{y}}{2}\right)+\frac{\boldsymbol{y}-\boldsymbol{x}}{2}\\|^{2} \\ & + \\|\left(\boldsymbol{z}+\frac{\boldsymbol{x}+\boldsymbol{y}}{2}\right)-\frac{\boldsymbol{x}-\boldsymbol{y}}{2}\\|^{2}-\\|\left(\boldsymbol{z}-\frac{\boldsymbol{x}+\boldsymbol{y}}{2}\right)-\frac{\boldsymbol{y}-\boldsymbol{x}}{2} \\|^{2} \\ & \stackrel{(8.35)}{=} 2\\|\boldsymbol{z}+ \frac{\boldsymbol{x}+\boldsymbol{y}}{2}\\|^{2}+2\\|\frac{\boldsymbol{x}-\boldsymbol{y}}{2}\\|^{2}-2\\|\boldsymbol{z}-\frac{\boldsymbol{x}+\boldsymbol{y}}{2}\\|^{2}-2\\| \frac{\boldsymbol{y}-\boldsymbol{x}}{2}\\|^{2} \\ & \stackrel{(8.36)}{=} 8 \langle\frac{\boldsymbol{x}+\boldsymbol{y}}{2}, \boldsymbol{z}\rangle, \end{aligned}$
lyche-numerical-linear-algebra_EQ0615	226	0.721	\boldsymbol{A}^{*} \boldsymbol{A}=\left[\begin{array}{ll} 1 & 1 \\ 1 & 2 \end{array}\right],\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1}=\left[\begin{array}{cc} 2 & -1 \\ -1 & 1 \end{array}\right], \boldsymbol{A}^{\dagger}=\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1} \boldsymbol{A}^{*}=\left[\begin{array}{ccc} 1 & -1 & 0 \\ 0 & 1 & 0 \end{array} \right] .	$\boldsymbol{A}^{*} \boldsymbol{A}=\left[\begin{array}{ll} 1 & 1 \\ 1 & 2 \end{array}\right],\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1}=\left[\begin{array}{cc} 2 & -1 \\ -1 & 1 \end{array}\right], \boldsymbol{A}^{\dagger}=\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1} \boldsymbol{A}^{*}=\left[\begin{array}{ccc} 1 & -1 & 0 \\ 0 & 1 & 0 \end{array} \right] .$	$\boldsymbol{A}^{*} \boldsymbol{A}=\left[\begin{array}{ll} 1 & 1 \\ 1 & 2 \end{array}\right],\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1}=\left[\begin{array}{cc} 2 & -1 \\ -1 & 1 \end{array}\right], \boldsymbol{A}^{\dagger}=\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1} \boldsymbol{A}^{*}=\left[\begin{array}{ccc} 1 & -1 & 0 \\ 0 & 1 & 0 \end{array} \right] .$
lyche-numerical-linear-algebra_EQ0460 (2)	182	0.722	\boldsymbol{A}:=\left[\begin{array}{rrr} 0 & 3 & 3 \\ 4 & 1 & -1 \\ 4 & 1 & -1 \\ 0 & 3 & 3 \end{array}\right]= \left[\begin{array}{rrrr} \frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} \\ \frac{1}{2} & -\frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \end{array}\right]\left[\begin{array}{lll} 6 & 0 & 0 \\ 0 & 6 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{array}\right]\left[\begin{array}{rrr} \frac{2}{3} & \frac{2}{3} & \frac{1}{3} \\ \frac{2}{3} & -\frac{1}{3} & -\frac{2}{3} \\ \frac{1}{3} & -\frac{2}{3} & \frac{2}{3} \end{array}\right]	$\boldsymbol{A}:=\left[\begin{array}{rrr} 0 & 3 & 3 \\ 4 & 1 & -1 \\ 4 & 1 & -1 \\ 0 & 3 & 3 \end{array}\right]= \left[\begin{array}{rrrr} \frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} \\ \frac{1}{2} & -\frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \end{array}\right]\left[\begin{array}{lll} 6 & 0 & 0 \\ 0 & 6 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{array}\right]\left[\begin{array}{rrr} \frac{2}{3} & \frac{2}{3} & \frac{1}{3} \\ \frac{2}{3} & -\frac{1}{3} & -\frac{2}{3} \\ \frac{1}{3} & -\frac{2}{3} & \frac{2}{3} \end{array}\right]$	$\boldsymbol{A}:=\left[\begin{array}{rrr} 0 & 3 & 3 \\ 4 & 1 & -1 \\ 4 & 1 & -1 \\ 0 & 3 & 3 \end{array}\right]= \left[\begin{array}{rrrr} \frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} \\ \frac{1}{2} & -\frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \end{array}\right]\left[\begin{array}{lll} 6 & 0 & 0 \\ 0 & 6 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{array}\right]\left[\begin{array}{rrr} \frac{2}{3} & \frac{2}{3} & \frac{1}{3} \\ \frac{2}{3} & -\frac{1}{3} & -\frac{2}{3} \\ \frac{1}{3} & -\frac{2}{3} & \frac{2}{3} \end{array}\right]$
lyche-numerical-linear-algebra_EQ0736	261	0.724	\boldsymbol{T} \boldsymbol{X}+\boldsymbol{X} \boldsymbol{D}=\boldsymbol{C}, \text { where } \boldsymbol{X}=\boldsymbol{V} \boldsymbol{S}, \text { and } \boldsymbol{C}=h^{2} \boldsymbol{F} \boldsymbol{S} .	$\boldsymbol{T} \boldsymbol{X}+\boldsymbol{X} \boldsymbol{D}=\boldsymbol{C}, \text { where } \boldsymbol{X}=\boldsymbol{V} \boldsymbol{S}, \text { and } \boldsymbol{C}=h^{2} \boldsymbol{F} \boldsymbol{S} .$	$\boldsymbol{T} \boldsymbol{X}+\boldsymbol{X} \boldsymbol{D}=\boldsymbol{C}, \text { where } \boldsymbol{X}=\boldsymbol{V} \boldsymbol{S}, \text { and } \boldsymbol{C}=h^{2} \boldsymbol{F} \boldsymbol{S} .$

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lyche-numerical-linear-algebra_EQ0668	241	0.727	\boldsymbol{A}=\left[\begin{array}{rrrrrrrr} 4 & -1 & 0 & -1 & 0 & 0 & 0 & 0 \\ -1 & 4 & -1 & 0 & -1 & 0 & 0 & 0 \\ 0 & -1 & 4 & 0 & 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 4 & -1 & 0 & -1 & 0 \\ 0 & -1 & 0 & -1 & 4 & -1 & 0 & -1 \\ 0 & 0 & -1 & 0 & -1 & 4 & 0 & 0 \\ 0 & 0 & 0 & -1 & 0 & 0 & 4 & -1 \\ 0 & 0 & 0 & 0 & -1 & 0 & -1 & 4 \\ 0 & 0 & 0 & 0 & 0 & -1 & 0 & -1 \end{array}\right] .	$\boldsymbol{A}=\left[\begin{array}{rrrrrrrr} 4 & -1 & 0 & -1 & 0 & 0 & 0 & 0 \\ -1 & 4 & -1 & 0 & -1 & 0 & 0 & 0 \\ 0 & -1 & 4 & 0 & 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 4 & -1 & 0 & -1 & 0 \\ 0 & -1 & 0 & -1 & 4 & -1 & 0 & -1 \\ 0 & 0 & -1 & 0 & -1 & 4 & 0 & 0 \\ 0 & 0 & 0 & -1 & 0 & 0 & 4 & -1 \\ 0 & 0 & 0 & 0 & -1 & 0 & -1 & 4 \\ 0 & 0 & 0 & 0 & 0 & -1 & 0 & -1 \end{array}\right] .$	$\boldsymbol{A}=\left[\begin{array}{rrrrrrrr} 4 & -1 & 0 & -1 & 0 & 0 & 0 & 0 \\ -1 & 4 & -1 & 0 & -1 & 0 & 0 & 0 \\ 0 & -1 & 4 & 0 & 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 4 & -1 & 0 & -1 & 0 \\ 0 & -1 & 0 & -1 & 4 & -1 & 0 & -1 \\ 0 & 0 & -1 & 0 & -1 & 4 & 0 & 0 \\ 0 & 0 & 0 & -1 & 0 & 0 & 4 & -1 \\ 0 & 0 & 0 & 0 & -1 & 0 & -1 & 4 \\ 0 & 0 & 0 & 0 & 0 & -1 & 0 & -1 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0976 (14.1)	330	0.729	|\mu-\lambda| \leq K\\|E\\|_{2}^{1 / n}, \quad K=\left(\\|A\\|_{2}+\\|A+E\\|_{2}\right)^{1-1 / n} .	$\|\mu-\lambda\| \leq K\\|E\\|_{2}^{1 / n}, \quad K=\left(\\|A\\|_{2}+\\|A+E\\|_{2}\right)^{1-1 / n} .$	$\|\mu-\lambda\| \leq K\\|\boldsymbol{E}\\|_{2}^{1 / n}, \quad K=\left(\\|\boldsymbol{A}\\|_{2}+\\|\boldsymbol{A}+\boldsymbol{E}\\|_{2}\right)^{1-1 / n} .$
lyche-numerical-linear-algebra_EQ0676 (10.13)	243	0.737	\begin{aligned} (\lambda \boldsymbol{A}) \otimes(\mu \boldsymbol{B}) & =\lambda \mu(\boldsymbol{A} \otimes \boldsymbol{B}) \\ \left(\boldsymbol{A}_{1}+ \boldsymbol{A}_{2}\right) \otimes \boldsymbol{B} & =\boldsymbol{A}_{1} \otimes \boldsymbol{B}+ \boldsymbol{A}_{2} \otimes \boldsymbol{B}, \\ \boldsymbol{A} \otimes\left(\boldsymbol{B}_{1}+ \boldsymbol{B}_{2}\right) & =\boldsymbol{A} \otimes \boldsymbol{B}_{1}+\boldsymbol{A} \otimes \boldsymbol{B}_{2} \\ (\boldsymbol{A} \otimes \boldsymbol{B}) \otimes \boldsymbol{C} & =\boldsymbol{A}\otimes(\boldsymbol{B} \otimes \boldsymbol{C}) . \end{aligned}	$\begin{aligned} (\lambda \boldsymbol{A}) \otimes(\mu \boldsymbol{B}) & =\lambda \mu(\boldsymbol{A} \otimes \boldsymbol{B}) \\ \left(\boldsymbol{A}_{1}+ \boldsymbol{A}_{2}\right) \otimes \boldsymbol{B} & =\boldsymbol{A}_{1} \otimes \boldsymbol{B}+ \boldsymbol{A}_{2} \otimes \boldsymbol{B}, \\ \boldsymbol{A} \otimes\left(\boldsymbol{B}_{1}+ \boldsymbol{B}_{2}\right) & =\boldsymbol{A} \otimes \boldsymbol{B}_{1}+\boldsymbol{A} \otimes \boldsymbol{B}_{2} \\ (\boldsymbol{A} \otimes \boldsymbol{B}) \otimes \boldsymbol{C} & =\boldsymbol{A}\otimes(\boldsymbol{B} \otimes \boldsymbol{C}) . \end{aligned}$	$\begin{aligned} (\lambda \boldsymbol{A}) \otimes(\mu \boldsymbol{B}) & =\lambda \mu(\boldsymbol{A} \otimes \boldsymbol{B}) \\ \left(\boldsymbol{A}_{1}+ \boldsymbol{A}_{2}\right) \otimes \boldsymbol{B} & =\boldsymbol{A}_{1} \otimes \boldsymbol{B}+ \boldsymbol{A}_{2} \otimes \boldsymbol{B}, \\ \boldsymbol{A} \otimes\left(\boldsymbol{B}_{1}+ \boldsymbol{B}_{2}\right) & =\boldsymbol{A} \otimes \boldsymbol{B}_{1}+\boldsymbol{A} \otimes \boldsymbol{B}_{2} \\ (\boldsymbol{A} \otimes \boldsymbol{B}) \otimes \boldsymbol{C} & =\boldsymbol{A}\otimes(\boldsymbol{B} \otimes \boldsymbol{C}) . \end{aligned}$
lyche-numerical-linear-algebra_EQ0466 (8.3)	186	0.737	\sum_{j=1}^{n}\left|x_{j} y_{j}\right| \leq\\| \boldsymbol{x}\\|_{p}\\|\boldsymbol{y}\\|_{q}, \quad \frac{1}{p}+\frac{1}{q}=1, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{C}^{n} .	$\sum_{j=1}^{n}\left\|x_{j} y_{j}\right\| \leq\\|\boldsymbol{x}\\|_{p}\\|\boldsymbol{y}\\|_{q}, \quad \frac{1}{p}+\frac{1}{q}=1, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{C}^{n} .$	$\sum_{j=1}^{n}\left\|x_{j} y_{j}\right\| \leq\\|\boldsymbol{x}\\|_{p}\\|\boldsymbol{y}\\|_{q}, \quad \frac{1}{p}+\frac{1}{q}=1, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{C}^{n} .$
lyche-numerical-linear-algebra_EQ0897	308	0.743	\frac{\left(\boldsymbol{y}^{T} \boldsymbol{A y} \right)\left(\boldsymbol{y}^{T} \boldsymbol{A}^{-1} \boldsymbol{y}\right)}{\left(\boldsymbol{y}^{T} \boldsymbol{y}\right)^{2}}=a b \leq \frac{(M+m)^{2}}{4 M m},	$\frac{\left(\boldsymbol{y}^{T} \boldsymbol{A y} \right)\left(\boldsymbol{y}^{T} \boldsymbol{A}^{-1} \boldsymbol{y}\right)}{\left(\boldsymbol{y}^{T} \boldsymbol{y}\right)^{2}}=a b \leq \frac{(M+m)^{2}}{4 M m},$	$\frac{\left(\boldsymbol{y}^{T} \boldsymbol{A y} \right)\left(\boldsymbol{y}^{T} \boldsymbol{A}^{-1} \boldsymbol{y}\right)}{\left(\boldsymbol{y}^{T} \boldsymbol{y}\right)^{2}}=a b \leq \frac{(M+m)^{2}}{4 M m},$
lyche-numerical-linear-algebra_EQ0582	216	0.744	\begin{array}{c|c|c|c|c} \boldsymbol{u} & \boldsymbol{u}_{1} & \boldsymbol{u}_{2} & \cdots & \boldsymbol{u}_{m} \\ \hline & y_{1} & y_{2} & \cdots & y_{m} \end{array} .	$\begin{array}{c\|c\|c\|c\|c} \boldsymbol{u} & \boldsymbol{u}_{1} & \boldsymbol{u}_{2} & \cdots & \boldsymbol{u}_{m} \\ \hline & y_{1} & y_{2} & \cdots & y_{m} \end{array} .$	$\begin{array}{c\|c\|c\|c\|c} \boldsymbol{u} & \boldsymbol{u}_{1} & \boldsymbol{u}_{2} & \cdots & \boldsymbol{u}_{m} \\ \hline & y_{1} & y_{2} & \cdots & y_{m} \end{array} .$

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lyche-numerical-linear-algebra_EQ0204	85	0.749	`\begin{aligned} & \text { for } i=k+1: n \\ & \qquad \begin{array}{l} a_{p_{i}, k}^{(k)}=a_{p_{i}, k}^{(k)} / a_{p_{k}, k}^{(k)} \\ \text { for } j=k: n \\ \qquad a_{p_{i}, j}^{(k+1)}=a_{p_{i}, j}^{(k)}-a_{p_{i}, k}^{(k)} a_{p_{k}, j}^{(k)} \end{array} \end{aligned}`	$\begin{aligned} & \text { for } i=k+1: n \\ & \qquad \begin{array}{l} a_{p_{i}, k}^{(k)}=a_{p_{i}, k}^{(k)} / a_{p_{k}, k}^{(k)} \\ \text { for } j=k: n \\ \qquad a_{p_{i}, j}^{(k+1)}=a_{p_{i}, j}^{(k)}-a_{p_{i}, k}^{(k)} a_{p_{k}, j}^{(k)} \end{array} \end{aligned}$	$\begin{aligned} & \text { for } i=k+1: n \\ & \qquad \begin{array}{l} a_{p_{i}, k}^{(k)}=a_{p_{i}, k}^{(k)} / a_{p_{k}, k}^{(k)} \\ \text { for } j=k: n \\ \qquad a_{p_{i}, j}^{(k+1)}=a_{p_{i}, j}^{(k)}-a_{p_{i}, k}^{(k)} a_{p_{k}, j}^{(k)} \end{array} \end{aligned}$
lyche-numerical-linear-algebra_EQ0142	65	0.749	`\boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \mathbf{0} & \boldsymbol{A}_{22} \end{array}\right]`	$\boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \mathbf{0} & \boldsymbol{A}_{22} \end{array}\right]$	$\boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \mathbf{0} & \boldsymbol{A}_{22} \end{array}\right]$
lyche-numerical-linear-algebra_EQ0707	253	0.749	`(\boldsymbol{D} \boldsymbol{X}+\boldsymbol{X} \boldsymbol{D})_{j, k}=\sum_{\ell=1}^{m} d_{j, \ell} x_{\ell, k}+\sum_{\ell=1}^{m} x_{j, \ell} d_{\ell, k}= \lambda_{j} x_{j, k}+\lambda_{k} x_{j, k}`	$(\boldsymbol{D} \boldsymbol{X}+\boldsymbol{X} \boldsymbol{D})_{j, k}=\sum_{\ell=1}^{m} d_{j, \ell} x_{\ell, k}+\sum_{\ell=1}^{m} x_{j, \ell} d_{\ell, k}= \lambda_{j} x_{j, k}+\lambda_{k} x_{j, k}$	$(\boldsymbol{D} \boldsymbol{X}+\boldsymbol{X} \boldsymbol{D})_{j, k}=\sum_{\ell=1}^{m} d_{j, \ell} x_{\ell, k}+\sum_{\ell=1}^{m} x_{j, \ell} d_{\ell, k}= \lambda_{j} x_{j, k}+\lambda_{k} x_{j, k}$
lyche-numerical-linear-algebra_EQ0959 (13.68)	322	0.749	`\omega_{k}:= \begin{cases}1, & \text { if } k=0 \\ \left(1+\omega_{k-1}^{-1} \rho_{k} / \rho_{k-1} \right)^{-1}, & \text { otherwise. }\end{cases}`	$\omega_{k}:= \begin{cases}1, & \text { if } k=0 \\ \left(1+\omega_{k-1}^{-1} \rho_{k} / \rho_{k-1} \right)^{-1}, & \text { otherwise. }\end{cases}$	$\omega_{k}:= \begin{cases}1, & \text { if } k=0 \\ \left(1+\omega_{k-1}^{-1} \rho_{k} / \rho_{k-1} \right)^{-1}, & \text { otherwise. }\end{cases}$
lyche-numerical-linear-algebra_EQ0575	213	0.751	`\begin{aligned} & x_{1}=1 \\ & x_{1}=1, \quad \boldsymbol{A}=\left[\begin{array}{l} 1 \\ 1 \\ x_{1}=2 \end{array}\right], \quad \boldsymbol{x}=\left[x_{1} \right], \quad \boldsymbol{b}=\left[\begin{array}{l} 1 \\ 1 \\ 1 \end{array}\right] . \end{aligned}`	$\begin{aligned} & x_{1}=1 \\ & x_{1}=1, \quad \boldsymbol{A}=\left[\begin{array}{l} 1 \\ 1 \\ x_{1}=2 \end{array}\right], \quad \boldsymbol{x}=\left[x_{1} \right], \quad \boldsymbol{b}=\left[\begin{array}{l} 1 \\ 1 \\ 1 \end{array}\right] . \end{aligned}$	$\begin{aligned} & x_{1}=1 \\ & x_{1}=1, \quad \boldsymbol{A}=\left[\begin{array}{l} 1 \\ 1 \\ 1 \end{array}\right], \quad \boldsymbol{x}=\left[x_{1} \right], \quad \boldsymbol{b}=\left[\begin{array}{l} 1 \\ 1 \\ 2 \end{array}\right] . \\ & x_{1}=2 \end{aligned}$
lyche-numerical-linear-algebra_EQ0649	234	0.756	`U^{*} A V=\left[\begin{array}{cc} \Sigma_{1} & 0 \\ \mathbf{0} & \mathbf{0} \end{array}\right]`	$U^{*} A V=\left[\begin{array}{cc} \Sigma_{1} & 0 \\ \mathbf{0} & \mathbf{0} \end{array}\right]$	$\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{V}=\left[\begin{array}{cc} \boldsymbol{\Sigma}_{1} & \mathbf{0} \\ \mathbf{0} & \mathbf{0} \end{array}\right]$
lyche-numerical-linear-algebra_EQ0667 (10.8)	240	0.758	`\begin{aligned} a_{i i}=4, & i=1, \ldots, n, \\ a_{i+1, i}=a_{i, i+1}=-1, & i=1, \ldots, n-1, \quad i \neq m, 2 m, \ldots,(m-1) m, \\ a_{i+m, i}=a_{i, i+m}=-1, & i=1, \ldots, n-m, \\ a_{i j}=0, & \text { otherwise } . \end{aligned}`	$\begin{aligned} a_{i i}=4, & i=1, \ldots, n, \\ a_{i+1, i}=a_{i, i+1}=-1, & i=1, \ldots, n-1, \quad i \neq m, 2 m, \ldots,(m-1) m, \\ a_{i+m, i}=a_{i, i+m}=-1, & i=1, \ldots, n-m, \\ a_{i j}=0, & \text { otherwise } . \end{aligned}$	$\begin{aligned} a_{i i}=4, & i=1, \ldots, n, \\ a_{i+1, i}=a_{i, i+1}=-1, & i=1, \ldots, n-1, \quad i \neq m, 2 m, \ldots,(m-1) m, \\ a_{i+m, i}=a_{i, i+m}=-1, & i=1, \ldots, n-m, \\ a_{i j}=0, & \text { otherwise. } \end{aligned}$
lyche-numerical-linear-algebra_EQ1018	345	0.760	`z_{k}=c_{1} \lambda_{1}^{k} v_{1}+c_{2} \lambda_{2}^{k} v_{2}=c_{1} 3^{k} v_{1}+c_{2} 1^{k} v_{2} .`	$z_{k}=c_{1} \lambda_{1}^{k} v_{1}+c_{2} \lambda_{2}^{k} v_{2}=c_{1} 3^{k} v_{1}+c_{2} 1^{k} v_{2} .$	$z_{k}=c_{1} \lambda_{1}^{k} \boldsymbol{v}_{1}+c_{2} \lambda_{2}^{k} \boldsymbol{v}_{2}=c_{1} 3^{k} \boldsymbol{v}_{1}+c_{2} 1^{k} \boldsymbol{v}_{2} .$
lyche-numerical-linear-algebra_EQ0408	163	0.761	`\boldsymbol{A}=\frac{1}{6}\left[\begin{array}{cc} 3 & 4 \\ 4 & -3 \end{array}\right]`	$\boldsymbol{A}=\frac{1}{6}\left[\begin{array}{cc} 3 & 4 \\ 4 & -3 \end{array}\right]$	$\boldsymbol{A}=\frac{1}{6}\left[\begin{array}{cc} 3 & 4 \\ 4 & -3 \end{array}\right]$
lyche-numerical-linear-algebra_EQ0651	234	0.763	`\text { (1) } \quad \boldsymbol{A} \boldsymbol{x}= \boldsymbol{b}, \quad \text { (2) } \quad \boldsymbol{A}^{*} \boldsymbol{y}=\mathbf{0}, \boldsymbol{y}^{*} \boldsymbol{b} \neq 0 \text {. }`	$\text { (1) } \quad \boldsymbol{A} \boldsymbol{x}= \boldsymbol{b}, \quad \text { (2) } \quad \boldsymbol{A}^{*} \boldsymbol{y}=\mathbf{0}, \boldsymbol{y}^{*} \boldsymbol{b} \neq 0 \text {. }$	$\text { (1) } \quad \boldsymbol{A} \boldsymbol{x}= \boldsymbol{b}, \quad \text { (2) } \quad \boldsymbol{A}^{*} \boldsymbol{y}=\mathbf{0}, \boldsymbol{y}^{*} \boldsymbol{b} \neq 0 \text {. }$
lyche-numerical-linear-algebra_EQ0176	77	0.770	`\text { for } \begin{aligned} i & =k+1: n \\ l_{i k}^{(k)} & =a_{i k}^{(k)} / a_{k k}^{(k)} \end{aligned}`	$\text { for } \begin{aligned} i & =k+1: n \\ l_{i k}^{(k)} & =a_{i k}^{(k)} / a_{k k}^{(k)} \end{aligned}$	$\text { for } i=k+1: n$ $l_{i k}^{(k)}=a_{i k}^{(k)} / a_{k k}^{(k)}$

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lyche-numerical-linear-algebra_EQ0772 (12.19)	273	0.772	`\begin{gathered} \rho(\boldsymbol{I}-\alpha \boldsymbol{A})>\rho\left(\boldsymbol{I}-\alpha_{o} \boldsymbol{A}\right)=\frac{\kappa-1}{\kappa+1}, \quad \alpha \in \mathbb{R} \backslash\left\{\alpha_{o} \right\}, \\ \kappa:=\frac{\lambda_{1}}{\lambda_{n}}, \quad \alpha_{o}:=\frac{2}{\lambda_{1}+\lambda_{n}} . \end{gathered}`	$\rho(\boldsymbol{I}-\alpha \boldsymbol{A})>\rho\left(\boldsymbol{I}-\alpha_{o} \boldsymbol{A}\right)=\frac{\kappa-1}{\kappa+1}, \quad \alpha \in \mathbb{R} \backslash\left\{\alpha_{o}\right\}, \\ \kappa:=\frac{\lambda_{1}}{\lambda_{n}}, \quad \alpha_{o}:=\frac{2}{\lambda_{1}+\lambda_{n}} .$	$\rho(\boldsymbol{I}-\alpha \boldsymbol{A})>\rho(\boldsymbol{I}-\alpha_{o} \boldsymbol{A})=\frac{\kappa-1}{\kappa+1}, \quad \alpha \in \mathbb{R} \backslash\{\alpha_{o}\}, \\ \kappa:=\frac{\lambda_{1}}{\lambda_{n}}, \quad \alpha_{o}:=\frac{2}{\lambda_{1}+\lambda_{n}} .$
lyche-numerical-linear-algebra_EQ0915 (13.47)	311	0.779	`\boldsymbol{x}_{k}:=\boldsymbol{C}^{T} \boldsymbol{y}_{k}, \quad \boldsymbol{p}_{k}:= \boldsymbol{C}^{T} \boldsymbol{q}_{k}, \quad \boldsymbol{s}_{k}:=\boldsymbol{C}^{T} z_{k}, \quad \boldsymbol{r}_{k}:=\boldsymbol{C}^{-1} z_{k}`	$\boldsymbol{x}_{k}:=\boldsymbol{C}^{T} \boldsymbol{y}_{k}, \quad \boldsymbol{p}_{k}:= \boldsymbol{C}^{T} \boldsymbol{q}_{k}, \quad \boldsymbol{s}_{k}:=\boldsymbol{C}^{T} z_{k}, \quad \boldsymbol{r}_{k}:=\boldsymbol{C}^{-1} z_{k}$	$\boldsymbol{x}_{k}:=\boldsymbol{C}^{T} \boldsymbol{y}_{k}, \quad \boldsymbol{p}_{k}:= \boldsymbol{C}^{T} \boldsymbol{q}_{k}, \quad \boldsymbol{s}_{k}:=\boldsymbol{C}^{T} z_{k}, \quad \boldsymbol{r}_{k}:=\boldsymbol{C}^{-1} z_{k}$
lyche-numerical-linear-algebra_EQ0610	223	0.780	`\boldsymbol{v}=\boldsymbol{U} \boldsymbol{U}^{*} \boldsymbol{v}=\left[\boldsymbol{U}_{1}, \boldsymbol{U}_{2}\left[\begin{array}{l} \boldsymbol{U}_{1}^{*} \\ \boldsymbol{U}_{2}^{*} \end{array}\right] \boldsymbol{v}=\boldsymbol{s}+ \boldsymbol{t},\right.`	$\boldsymbol{v}=\boldsymbol{U} \boldsymbol{U}^{*} \boldsymbol{v}=\left[\boldsymbol{U}_{1}, \boldsymbol{U}_{2}\left[\begin{array}{l} \boldsymbol{U}_{1}^{*} \\ \boldsymbol{U}_{2}^{*} \end{array}\right] \boldsymbol{v}=\boldsymbol{s}+ \boldsymbol{t},\right.$	$\boldsymbol{v}=\boldsymbol{U} \boldsymbol{U}^{*} \boldsymbol{v}=\left[\boldsymbol{U}_{1}, \boldsymbol{U}_{2}\left[\begin{array}{l} \boldsymbol{U}_{1}^{*} \\ \boldsymbol{U}_{2}^{*} \end{array}\right] \boldsymbol{v}=\boldsymbol{s}+ \boldsymbol{t},\right.$
lyche-numerical-linear-algebra_EQ0203 (3.13)	85	0.781	`\begin{aligned} & \boldsymbol{p}=[1, \ldots, n]^{T} ; \ \ & \text { for } k=1: n-1 \\ & \text { choose } r_{k} \geq k \text { so that } a_{p_{r_{k}}, k}^{(k)} \neq 0 \text {. } \\ & \qquad \boldsymbol{p}=I_{r_{k}, k} \boldsymbol{p} \end{aligned}`	$\begin{aligned} & \boldsymbol{p}=[1, \ldots, n]^{T} ; \ \ & \text { for } k=1: n-1 \\ & \text { choose } r_{k} \geq k \text { so that } a_{p_{r_{k}}, k}^{(k)} \neq 0 \text {. } \\ & \qquad \boldsymbol{p}=I_{r_{k}, k} \boldsymbol{p} \end{aligned}$	$\begin{aligned} & \boldsymbol{p}=[1, \ldots, n]^{T} ; \ \ & \text { for } k=1: n-1 \\ & \text { choose } r_{k} \geq k \text { so that } a_{p_{r_{k}}, k}^{(k)} \neq 0 \text {. } \\ & \qquad \boldsymbol{p}=I_{r_{k}, k} \boldsymbol{p} \end{aligned}$
lyche-numerical-linear-algebra_EQ0852 (13.15)	295	0.782	`\begin{aligned} & \text { For } k=0,1,2, \ldots \ \ & \qquad \boldsymbol{x}_{k+1}:=\boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k}, \quad \alpha_{k}:=\frac{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}}{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{k}}, \ \ & \boldsymbol{r}_{k+1}:=\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{A} \boldsymbol{p}_{k}, \end{aligned}`	$\begin{aligned} & \text { For } k=0,1,2, \ldots \ \ & \qquad \boldsymbol{x}_{k+1}:=\boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k}, \quad \alpha_{k}:=\frac{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}}{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{k}}, \ \ & \boldsymbol{r}_{k+1}:=\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{A} \boldsymbol{p}_{k}, \end{aligned}$	$\begin{aligned} & \text { For } k=0,1,2, \ldots \ \ & \qquad \boldsymbol{x}_{k+1}:=\boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k}, \quad \alpha_{k}:=\frac{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}}{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{k}}, \ \ & \boldsymbol{r}_{k+1}:=\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{A} \boldsymbol{p}_{k}, \end{aligned}$
lyche-numerical-linear-algebra_EQ0531	203	0.783	`\langle\boldsymbol{x}, \boldsymbol{z}\rangle+\langle \boldsymbol{y}, \boldsymbol{z}\rangle=2\left\langle \frac{\boldsymbol{x}+\boldsymbol{y}}{2}, \boldsymbol{z} \right\rangle, \quad \boldsymbol{x}, \boldsymbol{y}, \boldsymbol{z} \in \mathcal{V} .`	$\langle\boldsymbol{x}, \boldsymbol{z}\rangle+\langle \boldsymbol{y}, \boldsymbol{z}\rangle=2\left\langle \frac{\boldsymbol{x}+\boldsymbol{y}}{2}, \boldsymbol{z} \right\rangle, \quad \boldsymbol{x}, \boldsymbol{y}, \boldsymbol{z} \in \mathcal{V} .$	$\langle\boldsymbol{x}, \boldsymbol{z}\rangle+\langle \boldsymbol{y}, \boldsymbol{z}\rangle=2\langle \frac{\boldsymbol{x}+\boldsymbol{y}}{2}, \boldsymbol{z} \rangle, \quad \boldsymbol{x}, \boldsymbol{y}, \boldsymbol{z} \in \mathcal{V} .$
lyche-numerical-linear-algebra_EQ0009 (1.1)	23	0.784	`\delta_{i j}:= \begin{cases}1 & \text { if } i=j \\ 0 & \text { otherwise }\end{cases}`	$\delta_{ij}:=\begin{cases}1 & \text { if } i=j \\ 0 & \text { otherwise }\end{cases}$	$\delta_{ij}:=\begin{cases}1 & \text { if } i=j, \\ 0 & \text { otherwise, }\end{cases}$

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lyche-numerical-linear-algebra_EQ0108 (2.21)	57	0.788	`\boldsymbol{T} \boldsymbol{v}=\left[\begin{array}{rrrrr} 2 & -1 & 0 & & \\ -1 & 2 & -1 & & \\ 0 & \ddots & \ddots & \ddots & \\ & \ddots & \ddots & \ddots & \\ & & & 0 & 0 \\ & & & -1 & 2-1 \\ & & & 0-1 & 2 \end{array}\right]\left[\begin{array}{c} v_{1} \\ v_{2} \\ \vdots \\ v_{m-1} \\ v_{m} \end{array} \right]=h^{2}\left[\begin{array}{c} f(h) \\ f(2 h) \\ \vdots \\ f((m-1) h) \\ f(m h) \end{array}\right]=: \boldsymbol{b} .`	$\boldsymbol{T}\boldsymbol{v}=\left[\begin{array}{rrrrr} 2 & -1 & 0 & & \\ -1 & 2 & -1 & & \\ 0 & \ddots & \ddots & \ddots & \\ & \ddots & \ddots & \ddots & \\ & & & 0 & 0 \\ & & & -1 & 2-1 \\ & & & 0-1 & 2 \end{array}\right]\left[\begin{array}{c} v_{1} \\ v_{2} \\ \vdots \\ v_{m-1} \\ v_{m} \end{array} \right]=h^{2}\left[\begin{array}{c} f(h) \\ f(2 h) \\ \vdots \\ f((m-1) h) \\ f(m h) \end{array}\right]=: \boldsymbol{b} .$	$\boldsymbol{T}\boldsymbol{v}=\left[\begin{array}{rrrrr} 2 & -1 & 0 & & \\ -1 & 2 & -1 & & \\ 0 & \ddots & \ddots & \ddots & \\ & \ddots & \ddots & \ddots & \\ & & & 0 & 0 \\ & & & -1 & 2-1 \\ & & & 0-1 & 2 \end{array}\right]\left[\begin{array}{c} v_{1} \\ v_{2} \\ \vdots \\ v_{m-1} \\ v_{m} \end{array} \right]=h^{2}\left[\begin{array}{c} f(h) \\ f(2 h) \\ \vdots \\ f((m-1) h) \\ f(m h) \end{array}\right]=: \boldsymbol{b} .$
lyche-numerical-linear-algebra_EQ0401	160	0.791	`\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{V}=\left[ \begin{array}{c|c} \lambda & z^{*} \\ \hline \mathbf{0} & \boldsymbol{M} \end{array}\right],`	$\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{V}=\left[\begin{array}{c\|c} \lambda & z^{*} \\ \hline \mathbf{0} & \boldsymbol{M} \end{array}\right],$	$\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{V}=\left[\begin{array}{c\|c} \lambda & z^{*} \\ \hline \mathbf{0} & \boldsymbol{M} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0590	218	0.792	`\begin{aligned} \frac{1}{m} b_{i, j} & =\frac{1}{m} \sum_{k=1}^{m} t_{k}^{i+j-2}=\frac{1}{m} \sum_{k=1}^{m} \left(\frac{k-1}{m-1}\right)^{i+j-2} \\ & \approx \int_{0}^{1} x^{i+j-2} d x=\frac{1}{i+j-1}=h_{i, j} \end{aligned}`	$\begin{aligned} \frac{1}{m} b_{i, j} & =\frac{1}{m} \sum_{k=1}^{m} t_{k}^{i+j-2}=\frac{1}{m} \sum_{k=1}^{m} \left(\frac{k-1}{m-1}\right)^{i+j-2} \\ & \approx \int_{0}^{1} x^{i+j-2} d x=\frac{1}{i+j-1}=h_{i, j} \end{aligned}$	$\begin{aligned} \frac{1}{m} b_{i, j} & =\frac{1}{m} \sum_{k=1}^{m} t_{k}^{i+j-2}=\frac{1}{m} \sum_{k=1}^{m} \left(\frac{k-1}{m-1}\right)^{i+j-2} \\ & \approx \int_{0}^{1} x^{i+j-2} d x=\frac{1}{i+j-1}=h_{i, j} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0096 (0)	54	0.793	`\left[\begin{array}{lll} d_{1} & c_{1} & 0 \\ a_{1} & d_{2} & c_{2} \\ 0 & a_{2} & d_{3} \end{array}\right]= \left[\begin{array}{lll} 1 & 0 & 0 \\ l_{1} & 1 & 0 \\ 0 & l_{2} & 1 \end{array}\right]\left[\begin{array}{ccc} u_{1} & c_{1} & 0 \\ 0 & u_{2} & c_{2} \\ 0 & 0 & u_{3} \end{array}\right]=\left[\begin{array}{ccc} u_{1} & c_{1} & 0 \\ l_{1} u_{1} & l_{1} c_{1}+u_{2} & c_{2} \\ 0 & l_{2} u_{2} & l_{2} c_{2}+u_{3} \end{array}\right],`	$\left[\begin{array}{lll} d_{1} & c_{1} & 0 \\ a_{1} & d_{2} & c_{2} \\ 0 & a_{2} & d_{3} \end{array}\right]= \left[\begin{array}{lll} 1 & 0 & 0 \\ l_{1} & 1 & 0 \\ 0 & l_{2} & 1 \end{array}\right]\left[\begin{array}{ccc} u_{1} & c_{1} & 0 \\ 0 & u_{2} & c_{2} \\ 0 & 0 & u_{3} \end{array}\right]=\left[\begin{array}{ccc} u_{1} & c_{1} & 0 \\ l_{1} u_{1} & l_{1} c_{1}+u_{2} & c_{2} \\ 0 & l_{2} u_{2} & l_{2} c_{2}+u_{3} \end{array}\right],$	$\left[\begin{array}{lll} d_{1} & c_{1} & 0 \\ a_{1} & d_{2} & c_{2} \\ 0 & a_{2} & d_{3} \end{array}\right]= \left[\begin{array}{lll} 1 & 0 & 0 \\ l_{1} & 1 & 0 \\ 0 & l_{2} & 1 \end{array}\right]\left[\begin{array}{ccc} u_{1} & c_{1} & 0 \\ 0 & u_{2} & c_{2} \\ 0 & 0 & u_{3} \end{array}\right]=\left[\begin{array}{ccc} u_{1} & c_{1} & 0 \\ l_{1} u_{1} & l_{1} c_{1}+u_{2} & c_{2} \\ 0 & l_{2} u_{2} & l_{2} c_{2}+u_{3} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0752 (12.7)	268	0.800	`\begin{array}{r} S O R: \boldsymbol{v}_{k+1}(i, j)=\omega\left(\boldsymbol{v}_{k+1}(i-1, j)+ \boldsymbol{v}_{k+1}(i, j-1)+\boldsymbol{v}_{k}(i+1, j)\right. \\ \left.+\boldsymbol{v}_{k}(i, j+1)+\boldsymbol{e}(i, j)\right) / 4+(1-\omega) \boldsymbol{v}_{k}(i, j) . \end{array}`	$\begin{array}{r} S O R: \boldsymbol{v}_{k+1}(i, j)=\omega\left(\boldsymbol{v}_{k+1}(i-1, j)+\boldsymbol{v}_{k+1}(i, j-1)+\boldsymbol{v}_{k}(i+1, j)\right. \\ \left.+\boldsymbol{v}_{k}(i, j+1)+\boldsymbol{e}(i, j)\right) / 4+(1-\omega) \boldsymbol{v}_{k}(i, j) . \end{array}$	$\begin{array}{r} S O R: \boldsymbol{v}_{k+1}(i, j)=\omega\left(\boldsymbol{v}_{k+1}(i-1, j)+\boldsymbol{v}_{k+1}(i, j-1)+\boldsymbol{v}_{k}(i+1, j)\right. \\ \left.+\boldsymbol{v}_{k}(i, j+1)+\boldsymbol{e}(i, j)\right) / 4+(1-\omega) \boldsymbol{v}_{k}(i, j) . \end{array}$
lyche-numerical-linear-algebra_EQ0403	161	0.801	`\boldsymbol{V}^{*} \boldsymbol{A}^{*} \boldsymbol{V} \boldsymbol{u}=\left[\begin{array}{c|c} \bar{ \lambda} & \mathbf{0}^{*} \\ \hline \boldsymbol{z} & \boldsymbol{M}^{*} \end{array}\right]\left[\begin{array}{l} 0 \\ \boldsymbol{v} \end{array} \right]=\left[\begin{array}{c} 0 \\ \boldsymbol{M}^{*} \boldsymbol{v} \end{array}\right]=\bar{\lambda}\left[\begin{array}{l} 0 \\ \boldsymbol{v} \end{array}\right]`	$\boldsymbol{V}^{*} \boldsymbol{A}^{*} \boldsymbol{V} \boldsymbol{u}=\left[\begin{array}{c\|c} \bar{ \lambda} & \mathbf{0}^{*} \\ \hline \boldsymbol{z} & \boldsymbol{M}^{*} \end{array}\right]\left[\begin{array}{l} 0 \\ \boldsymbol{v} \end{array} \right]=\left[\begin{array}{c} 0 \\ \boldsymbol{M}^{*} \boldsymbol{v} \end{array}\right]=\bar{\lambda}\left[\begin{array}{l} 0 \\ \boldsymbol{v} \end{array}\right]$	$\boldsymbol{V}^{*} \boldsymbol{A}^{*} \boldsymbol{V} \boldsymbol{u}=\left[\begin{array}{c\|c} \bar{ \lambda} & \mathbf{0}^{*} \\ \hline \boldsymbol{z} & \boldsymbol{M}^{*} \end{array}\right]\left[\begin{array}{l} 0 \\ \boldsymbol{v} \end{array} \right]=\left[\begin{array}{c} 0 \\ \boldsymbol{M}^{*} \boldsymbol{v} \end{array}\right]=\bar{\lambda}\left[\begin{array}{l} 0 \\ \boldsymbol{v} \end{array}\right]$

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lyche-numerical-linear-algebra_EQ0588	217	0.812	`\boldsymbol{B}_{3} \boldsymbol{x}:=\left[\begin{array}{ccc} m & \sum t_{k} & \sum t_{k}^{2} \ \ \sum t_{k} & \sum t_{k}^{2} & \sum t_{k}^{3} \\ \sum t_{k}^{2} & \sum t_{k}^{3} & \sum t_{k}^{4} \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \\ x_{3} \end{array}\right]=\left[\begin{array}{c} \sum y_{k} \ \ \sum t_{k} y_{k} \\ \sum t_{k}^{2} y_{k} \end{array} \right] .`	$\boldsymbol{B}_{3} \boldsymbol{x}:=\left[\begin{array}{ccc} m & \sum t_{k} & \sum t_{k}^{2} \ \ \sum t_{k} & \sum t_{k}^{2} & \sum t_{k}^{3} \\ \sum t_{k}^{2} & \sum t_{k}^{3} & \sum t_{k}^{4} \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \\ x_{3} \end{array}\right]=\left[\begin{array}{c} \sum y_{k} \ \ \sum t_{k} y_{k} \\ \sum t_{k}^{2} y_{k} \end{array} \right] .$	$\boldsymbol{B}_{3} \boldsymbol{x}:=\left[\begin{array}{ccc} m & \sum t_{k} & \sum t_{k}^{2} \ \ \sum t_{k} & \sum t_{k}^{2} & \sum t_{k}^{3} \\ \sum t_{k}^{2} & \sum t_{k}^{3} & \sum t_{k}^{4} \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \\ x_{3} \end{array}\right]=\left[\begin{array}{c} \sum y_{k} \ \ \sum t_{k} y_{k} \\ \sum t_{k}^{2} y_{k} \end{array} \right] .$
lyche-numerical-linear-algebra_EQ0529 (8.37)	203	0.818	`\begin{gathered} \langle\boldsymbol{x}, \boldsymbol{z} \rangle+\langle\boldsymbol{y}, \boldsymbol{z}\rangle= \langle\boldsymbol{x}+\boldsymbol{y}, \boldsymbol{z} \rangle, \quad \boldsymbol{x}, \boldsymbol{y}, \boldsymbol{z} \in \mathcal{V} \\ \langle a \boldsymbol{x}, \boldsymbol{y}\rangle=a\langle \boldsymbol{x}, \boldsymbol{y}\rangle, \quad a \in \mathbb{R}, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathcal{V} . \end{gathered}`	$\begin{gathered} \langle\boldsymbol{x}, \boldsymbol{z} \rangle+\langle\boldsymbol{y}, \boldsymbol{z}\rangle= \langle\boldsymbol{x}+\boldsymbol{y}, \boldsymbol{z} \rangle, \quad \boldsymbol{x}, \boldsymbol{y}, \boldsymbol{z} \in \mathcal{V} \\ \langle a \boldsymbol{x}, \boldsymbol{y}\rangle=a\langle \boldsymbol{x}, \boldsymbol{y}\rangle, \quad a \in \mathbb{R}, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathcal{V} . \end{gathered}$	$\begin{gathered} \langle\boldsymbol{x}, \boldsymbol{z} \rangle+\langle\boldsymbol{y}, \boldsymbol{z}\rangle= \langle\boldsymbol{x}+\boldsymbol{y}, \boldsymbol{z} \rangle, \quad \boldsymbol{x}, \boldsymbol{y}, \boldsymbol{z} \in \mathcal{V} , \\ \langle a \boldsymbol{x}, \boldsymbol{y}\rangle=a\langle \boldsymbol{x}, \boldsymbol{y}\rangle, \quad a \in \mathbb{R}, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathcal{V} . \end{gathered}$
lyche-numerical-linear-algebra_EQ0089 (2.11)	51	0.822	`\left[\begin{array}{ccccc} 4 & 1 & & & \\ 1 & 4 & 1 & & \ \ & \ddots & \ddots & \ddots & \\ & & 1 & 4 & 1 \\ & & & 1 & 4 \end{array}\right]\left[\begin{array}{c} \mu_{2} \ \ \mu_{3} \\ \vdots \\ \mu_{n-1} \\ \mu_{n} \end{array} \right]=\frac{6}{h^{2}}\left[\begin{array}{c} \delta^{2} y_{2}-\mu_{1} \\ \delta^{2} y_{3} \\ \vdots \\ \delta^{2} y_{n-1} \\ \delta^{2} y_{n}-\mu_{n+1} \end{array}\right], \delta^{2} y_{i}:=y_{i+1}-2 y_{i}+y_{i-1} .`	$\left[\begin{array}{ccccc} 4 & 1 & & & \\ 1 & 4 & 1 & & \ \ & \ddots & \ddots & \ddots & \\ & & 1 & 4 & 1 \\ & & & 1 & 4 \end{array}\right]\left[\begin{array}{c} \mu_{2} \ \ \mu_{3} \\ \vdots \\ \mu_{n-1} \\ \mu_{n} \end{array} \right]=\frac{6}{h^{2}}\left[\begin{array}{c} \delta^{2} y_{2}-\mu_{1} \\ \delta^{2} y_{3} \\ \vdots \\ \delta^{2} y_{n-1} \\ \delta^{2} y_{n}-\mu_{n+1} \end{array}\right], \delta^{2} y_{i}:=y_{i+1}-2 y_{i}+y_{i-1} .$	$\left[\begin{array}{ccccc} 4 & 1 & & & \\ 1 & 4 & 1 & & \ \ & \ddots & \ddots & \ddots & \\ & & 1 & 4 & 1 \\ & & & 1 & 4 \end{array}\right]\left[\begin{array}{c} \mu_{2} \ \ \mu_{3} \\ \vdots \\ \mu_{n-1} \\ \mu_{n} \end{array} \right]=\frac{6}{h^{2}}\left[\begin{array}{c} \delta^{2} y_{2}-\mu_{1} \\ \delta^{2} y_{3} \\ \vdots \\ \delta^{2} y_{n-1} \\ \delta^{2} y_{n}-\mu_{n+1} \end{array}\right], \delta^{2} y_{i}:=y_{i+1}-2 y_{i}+y_{i-1} .$
lyche-numerical-linear-algebra_EQ0563 (8.44)	210	0.822	`\boldsymbol{A} \boldsymbol{s}=\boldsymbol{b},`	$\boldsymbol{A} \boldsymbol{s}=\boldsymbol{b},$	$\boldsymbol{A} \boldsymbol{s}=\boldsymbol{b},$
lyche-numerical-linear-algebra_EQ0354	142	0.825	`\left[\begin{array}{c} \boldsymbol{L}^{*} \\ \boldsymbol{z}^{*} \end{array}\right]=\boldsymbol{Q} \left[\begin{array}{c} \boldsymbol{R} \\ 0 \end{array} \right],`	$\left[\begin{array}{c} \boldsymbol{L}^{*} \\ \boldsymbol{z}^{*} \end{array}\right]=\boldsymbol{Q} \left[\begin{array}{c} \boldsymbol{R} \\ 0 \end{array} \right],$	$\left[\begin{array}{c} \boldsymbol{L}^{*} \\ \boldsymbol{z}^{*} \end{array}\right]=\boldsymbol{Q} \left[\begin{array}{c} \boldsymbol{R} \\ 0 \end{array} \right],$
lyche-numerical-linear-algebra_EQ0040 (1.14)	36	0.826	`\begin{aligned} \operatorname{det}(\boldsymbol{A}) & = \sum_{j=1}^{n}(-1)^{i+j} a_{i j} \operatorname{det}\left(\boldsymbol{A}_{i j}\right) \text { for } i=1, \ldots, n, \text { row } \\ \operatorname{det}(\boldsymbol{A}) & = \sum_{i=1}^{n}(-1)^{i+j} a_{i j} \operatorname{det}\left(\boldsymbol{A}_{i j}\right) \text { for } j=1, \ldots, n, \text { column. } \end{aligned}`	$\begin{aligned} \operatorname{det}(\boldsymbol{A}) & = \sum_{j=1}^{n}(-1)^{i+j} a_{i j} \operatorname{det}\left(\boldsymbol{A}_{i j}\right) \text { for } i=1, \ldots, n, \text { row } \\ \operatorname{det}(\boldsymbol{A}) & = \sum_{i=1}^{n}(-1)^{i+j} a_{i j} \operatorname{det}\left(\boldsymbol{A}_{i j}\right) \text { for } j=1, \ldots, n, \text { column. } \end{aligned}$	$\begin{aligned} \operatorname{det}(\boldsymbol{A}) & = \sum_{j=1}^{n}(-1)^{i+j} a_{i j} \operatorname{det}\left(\boldsymbol{A}_{i j}\right) \text { for } i=1, \ldots, n, \text { row } \\ \operatorname{det}(\boldsymbol{A}) & = \sum_{i=1}^{n}(-1)^{i+j} a_{i j} \operatorname{det}\left(\boldsymbol{A}_{i j}\right) \text { for } j=1, \ldots, n, \text { column. } \end{aligned}$
lyche-numerical-linear-algebra_EQ0338	136	0.827	`\left|\boldsymbol{x}^{T} \boldsymbol{A y}\right|^{2} \leq \boldsymbol{x}^{T} \boldsymbol{A x} \boldsymbol{y}^{T} \boldsymbol{A y}`	$\left\|\boldsymbol{x}^{T} \boldsymbol{A y}\right\|^{2} \leq \boldsymbol{x}^{T} \boldsymbol{A x} \boldsymbol{y}^{T} \boldsymbol{A y}$	$\left\|\boldsymbol{x}^{T} \boldsymbol{A y}\right\|^{2} \leq \boldsymbol{x}^{T} \boldsymbol{A x} \boldsymbol{y}^{T} \boldsymbol{A y}$

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lyche-numerical-linear-algebra_EQ1004	338	0.827	`\boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{y}= \boldsymbol{y}^{*} \boldsymbol{E}^{*} \boldsymbol{B} \boldsymbol{E} \boldsymbol{y}=z^{*} \boldsymbol{B} z= \sum_{i=m+1}^{n} \mu_{i}\left|z_{i}\right|^{2} \leq 0,`	$\boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{y}= \boldsymbol{y}^{*} \boldsymbol{E}^{*} \boldsymbol{B} \boldsymbol{E} \boldsymbol{y}=z^{*} \boldsymbol{B} z= \sum_{i=m+1}^{n} \mu_{i}\left\|z_{i}\right\|^{2} \leq 0,$	$\boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{y}= \boldsymbol{y}^{*} \boldsymbol{E}^{*} \boldsymbol{B} \boldsymbol{E} \boldsymbol{y}=z^{*} \boldsymbol{B} z= \sum_{i=m+1}^{n} \mu_{i}\left\|z_{i}\right\|^{2} \leq 0,$
lyche-numerical-linear-algebra_EQ0298	123	0.828	`\langle\boldsymbol{x}, \overline{\boldsymbol{A}} \boldsymbol{y}\rangle=(\overline{\boldsymbol{A}} \boldsymbol{y})^{*} \boldsymbol{x}=\boldsymbol{y}^{*} \overline{\boldsymbol{A}}^{*} \boldsymbol{x}= \boldsymbol{y}^{*} \boldsymbol{A}^{T} \boldsymbol{x}= \boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{x}=\langle \boldsymbol{A} \boldsymbol{x}, \boldsymbol{y}\rangle .`	$\langle\boldsymbol{x}, \overline{\boldsymbol{A}} \boldsymbol{y}\rangle=(\overline{\boldsymbol{A}} \boldsymbol{y})^{*} \boldsymbol{x}=\boldsymbol{y}^{*} \overline{\boldsymbol{A}}^{*} \boldsymbol{x}= \boldsymbol{y}^{*} \boldsymbol{A}^{T} \boldsymbol{x}= \boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{x}=\langle \boldsymbol{A} \boldsymbol{x}, \boldsymbol{y}\rangle .$	$\langle\boldsymbol{x}, \overline{\boldsymbol{A}} \boldsymbol{y}\rangle=(\overline{\boldsymbol{A}} \boldsymbol{y})^{*} \boldsymbol{x}=\boldsymbol{y}^{*} \overline{\boldsymbol{A}}^{*} \boldsymbol{x}= \boldsymbol{y}^{*} \boldsymbol{A}^{T} \boldsymbol{x}= \boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{x}=\langle \boldsymbol{A} \boldsymbol{x}, \boldsymbol{y}\rangle .$
lyche-numerical-linear-algebra_EQ0263	108	0.830	`\boldsymbol{A}=\boldsymbol{B B}^{*}, \quad \boldsymbol{B}=\left[\begin{array}{cc} 1 & 0 \\ 1 / 3 & 1 \end{array}\right]\left[\begin{array}{cc} \sqrt{3} & 0 \\ 0 & \sqrt{8 / 3} \end{array}\right] .`	$\boldsymbol{A}=\boldsymbol{B B}^{*}, \quad \boldsymbol{B}=\left[\begin{array}{cc} 1 & 0 \\ 1 / 3 & 1 \end{array}\right]\left[\begin{array}{cc} \sqrt{3} & 0 \\ 0 & \sqrt{8 / 3} \end{array}\right] .$	$\boldsymbol{A}=\boldsymbol{B B}^{*}, \quad \boldsymbol{B}=\left[\begin{array}{cc} 1 & 0 \\ 1 / 3 & 1 \end{array}\right]\left[\begin{array}{cc} \sqrt{3} & 0 \\ 0 & \sqrt{8 / 3} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0267	109	0.831	`\boldsymbol{L} \boldsymbol{L}^{*}=\left[\begin{array}{cc} \beta & \mathbf{0} \\ \boldsymbol{v} / \beta & \boldsymbol{L}_{1} \end{array}\right]\left[\begin{array}{cc} \beta & \boldsymbol{v}^{*} / \beta \\ \mathbf{0} & \boldsymbol{L}_{1}^{*} \end{array}\right]= \left[\begin{array}{ll} \alpha & \boldsymbol{v}^{*} \ \ \boldsymbol{v} & \boldsymbol{B} \end{array}\right]= \boldsymbol{A}`	$\boldsymbol{L} \boldsymbol{L}^{*}=\left[\begin{array}{cc} \beta & \mathbf{0} \\ \boldsymbol{v} / \beta & \boldsymbol{L}_{1} \end{array}\right]\left[\begin{array}{cc} \beta & \boldsymbol{v}^{*} / \beta \\ \mathbf{0} & \boldsymbol{L}_{1}^{*} \end{array}\right]=\left[\begin{array}{cc} \alpha & \boldsymbol{v}^{*} \\ \boldsymbol{v} & \boldsymbol{B} \end{array}\right]=\boldsymbol{A}$	$\boldsymbol{L} \boldsymbol{L}^{*}=\left[\begin{array}{cc} \beta & \mathbf{0} \\ \boldsymbol{v} / \beta & \boldsymbol{L}_{1} \end{array}\right]\left[\begin{array}{cc} \beta & \boldsymbol{v}^{*} / \beta \\ \mathbf{0} & \boldsymbol{L}_{1}^{*} \end{array}\right]=\left[\begin{array}{cc} \alpha & \boldsymbol{v}^{*} \\ \boldsymbol{v} & \boldsymbol{B} \end{array}\right]=\boldsymbol{A}$
lyche-numerical-linear-algebra_EQ0189 (3.7)	80	0.831	`x_{k}=\left(b_{k}-\sum_{j=1}^{k-1} a_{k, j} x_{j}\right) / a_{k k}, \quad k=1,2, \ldots, n .`	$x_{k}=\left(b_{k}-\sum_{j=1}^{k-1} a_{k, j} x_{j}\right) / a_{k k}, \quad k=1,2, \ldots, n .$	$x_{k}=\left(b_{k}-\sum_{j=1}^{k-1} a_{k, j} x_{j}\right) / a_{k k}, \quad k=1,2, \ldots, n .$
lyche-numerical-linear-algebra_EQ0122 (2.30)	61	0.833	`\begin{aligned} & \boldsymbol{s}_{j}=[\sin (j \pi h), \sin (2 j \pi h), \ldots, \sin (m j \pi h)]^{T}, \\ & \lambda_{j}=d+2 a \cos (j \pi h) . \end{aligned}`	$\begin{aligned} & \boldsymbol{s}_{j}=[\sin (j \pi h), \sin (2 j \pi h), \ldots, \sin (m j \pi h)]^{T}, \\ & \lambda_{j}=d+2 a \cos (j \pi h) . \end{aligned}$	$\begin{aligned} & \boldsymbol{s}_{j}=[\sin (j \pi h), \sin (2 j \pi h), \ldots, \sin (m j \pi h)]^{T}, \\ & \lambda_{j}=d+2 a \cos (j \pi h) . \end{aligned}$
lyche-numerical-linear-algebra_EQ0950 (13.64)	321	0.838	`\begin{aligned} & \langle\boldsymbol{B} \boldsymbol{x}, \boldsymbol{x}\rangle=0, \quad \boldsymbol{x} \in \mathbb{R}^{n}, \\ & \langle\boldsymbol{A} \boldsymbol{x}, \boldsymbol{x}\rangle=\langle \boldsymbol{x}, \boldsymbol{x}\rangle=|\boldsymbol{x}|_{2}^{2} . \end{aligned}`	$\begin{aligned} & \langle\boldsymbol{B} \boldsymbol{x}, \boldsymbol{x}\rangle=0, \quad \boldsymbol{x} \in \mathbb{R}^{n}, \\ & \langle\boldsymbol{A} \boldsymbol{x}, \boldsymbol{x}\rangle=\langle \boldsymbol{x}, \boldsymbol{x}\rangle=\|\boldsymbol{x}\|_{2}^{2} . \end{aligned}$	$\begin{aligned} & \langle\boldsymbol{B} \boldsymbol{x}, \boldsymbol{x}\rangle=0, \quad \boldsymbol{x} \in \mathbb{R}^{n}, \\ & \langle\boldsymbol{A} \boldsymbol{x}, \boldsymbol{x}\rangle=\langle \boldsymbol{x}, \boldsymbol{x}\rangle=\|\boldsymbol{x}\|_{2}^{2} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0321 (5.16)	130	0.839	`\int_{0}^{n} 4(m-k)(n+r-k) d k=2 m(n+r)^{2}- \frac{2}{3}(n+r)^{3} .`	$\int_{0}^{n} 4(m-k)(n+r-k) d k=2 m(n+r)^{2}- \frac{2}{3}(n+r)^{3} .$	$\int_{0}^{n} 4(m-k)(n+r-k) d k=2 m(n+r)^{2}- \frac{2}{3}(n+r)^{3} .$
lyche-numerical-linear-algebra_EQ0693 (10.23)	248	0.839	`\begin{array}{ll} \Delta^{2} u(s, t):=\Delta(\Delta u(s, t))=f(s, t) & (s, t) \in \Omega, \\ u(s, t)=0, & \Delta u(s, t)=0 \end{array}`	$\begin{array}{ll} \Delta^{2} u(s, t):=\Delta(\Delta u(s, t))=f(s, t) & (s, t) \in \Omega, \\ u(s, t)=0, & \Delta u(s, t)=0 \end{array}$	$\begin{array}{ll} \Delta^{2} u(s, t):=\Delta(\Delta u(s, t))=f(s, t) & (s, t) \in \Omega, \\ u(s, t)=0, & \Delta u(s, t)=0 \end{array}$
lyche-numerical-linear-algebra_EQ0828	287	0.840	`\boldsymbol{x}_{k}(1)=\boldsymbol{x}_{k}(2)=1-a^{k}, \quad k \geq 0,`	$\boldsymbol{x}_{k}(1)=\boldsymbol{x}_{k}(2)=1-a^{k}, \quad k \geq 0,$	$\boldsymbol{x}_{k}(1)=\boldsymbol{x}_{k}(2)=1-a^{k}, \quad k \geq 0,$
lyche-numerical-linear-algebra_EQ0282	118	0.842	`\boldsymbol{z}:=\boldsymbol{x}-a \boldsymbol{y}, \quad a:=\frac{\langle\boldsymbol{x}, \boldsymbol{y}\rangle}{ \langle\boldsymbol{y}, \boldsymbol{y}\rangle} .`	$\boldsymbol{z}:=\boldsymbol{x}-a \boldsymbol{y}, \quad a:=\frac{\langle\boldsymbol{x}, \boldsymbol{y}\rangle}{ \langle\boldsymbol{y}, \boldsymbol{y}\rangle} .$	$\boldsymbol{z}:=\boldsymbol{x}-a \boldsymbol{y}, \quad a:=\frac{\langle\boldsymbol{x}, \boldsymbol{y}\rangle}{ \langle\boldsymbol{y}, \boldsymbol{y}\rangle} .$

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lyche-numerical-linear-algebra_EQ0624	228	0.842	`\begin{aligned} \alpha_{j} & \leq \max _{\substack{ \boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\\|(\boldsymbol{B}+(\boldsymbol{A}-\boldsymbol{B})) \boldsymbol{x}\\|_{2}}{\\|\boldsymbol{x}\\|_{2}} \leq \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\\|\boldsymbol{B} \boldsymbol{x}\\|_{2}}{\\|\boldsymbol{x}\\|_{2}}+\max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\\|(\boldsymbol{A}-\boldsymbol{B}) \boldsymbol{x}\\|_{2}}{\\|\boldsymbol{x}\\|_{2}} \\ & \leq \beta_{j}+\\|\boldsymbol{A}-\boldsymbol{B}\\|_{2} . \end{aligned}`	$\alpha_j \leq \max_{\substack{\boldsymbol{x}\in\mathcal{S}\\ \boldsymbol{x}\neq\mathbf{0}}} \frac{\\|(\boldsymbol{B}+(\boldsymbol{A}-\boldsymbol{B}))\boldsymbol{x}\\|_2}{\\|\boldsymbol{x}\\|_2} \leq \max_{\substack{\boldsymbol{x}\in\mathcal{S}\\ \boldsymbol{x}\neq\mathbf{0}}} \frac{\\|\boldsymbol{B}\boldsymbol{x}\\|_2}{\\|\boldsymbol{x}\\|_2} + \max_{\substack{\boldsymbol{x}\in\mathcal{S}\\ \boldsymbol{x}\neq\mathbf{0}}} \frac{\\|(\boldsymbol{A}-\boldsymbol{B})\boldsymbol{x}\\|_2}{\\|\boldsymbol{x}\\|_2} \leq \beta_j + \\|\boldsymbol{A}-\boldsymbol{B}\\|_2.$	$\alpha_j \leq \max_{\substack{\boldsymbol{x}\in\mathcal{S}\\ \boldsymbol{x}\neq\mathbf{0}}} \frac{\\|(\boldsymbol{B}+(\boldsymbol{A}-\boldsymbol{B}))\boldsymbol{x}\\|_2}{\\|\boldsymbol{x}\\|_2} \leq \max_{\substack{\boldsymbol{x}\in\mathcal{S}\\ \boldsymbol{x}\neq\mathbf{0}}} \frac{\\|\boldsymbol{B}\boldsymbol{x}\\|_2}{\\|\boldsymbol{x}\\|_2} + \max_{\substack{\boldsymbol{x}\in\mathcal{S}\\ \boldsymbol{x}\neq\mathbf{0}}} \frac{\\|(\boldsymbol{A}-\boldsymbol{B})\boldsymbol{x}\\|_2}{\\|\boldsymbol{x}\\|_2} \leq \beta_j + \\|\boldsymbol{A}-\boldsymbol{B}\\|_2.$
lyche-numerical-linear-algebra_EQ0049	38	0.844	`\begin{aligned} \operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I}) & =\left(a_{11}-\lambda\right) \left|\begin{array}{cc} a_{22}-\lambda & a_{23} \ \ a_{32} & a_{33}-\lambda \end{array}\right|-a_{21} \left|\begin{array}{cc} a_{12} & a_{13} \\ a_{32} & a_{33}-\lambda \end{array}\right| \\ & +a_{31}\left| \begin{array}{cc} a_{12} & a_{13} \\ a_{22}-\lambda & a_{23} \end{array}\right| \\ & =\left(a_{11}-\lambda\right) \left(a_{22}-\lambda\right)\left(a_{33}-\lambda\right)+r(\lambda) \end{aligned}`	$\det(\boldsymbol{A}-\lambda\boldsymbol{I}) = (a_{11}-\lambda)\begin{vmatrix} a_{22}-\lambda & a_{23} \\ a_{32} & a_{33}-\lambda \end{vmatrix} - a_{21}\begin{vmatrix} a_{12} & a_{13} \\ a_{32} & a_{33}-\lambda \end{vmatrix} + a_{31}\begin{vmatrix} a_{12} & a_{13} \\ a_{22}-\lambda & a_{23} \end{vmatrix} = (a_{11}-\lambda)\left(a_{22}-\lambda\right)\left(a_{33}-\lambda\right)+r(\lambda)$	$\det(\boldsymbol{A}-\lambda\boldsymbol{I}) = (a_{11}-\lambda)\begin{vmatrix} a_{22}-\lambda & a_{23} \\ a_{32} & a_{33}-\lambda \end{vmatrix} - a_{21}\begin{vmatrix} a_{12} & a_{13} \\ a_{32} & a_{33}-\lambda \end{vmatrix} + a_{31}\begin{vmatrix} a_{12} & a_{13} \\ a_{22}-\lambda & a_{23} \end{vmatrix} = (a_{11}-\lambda)(a_{22}-\lambda)(a_{33}-\lambda)+r(\lambda)$
lyche-numerical-linear-algebra_EQ0851 (13.14)	295	0.846	`\beta_{k}:=-\frac{\boldsymbol{r}_{k+1}^{T} \boldsymbol{A} \boldsymbol{p}_{k}}{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{k}} \stackrel{\text { (13.13) }}{=} \frac{\boldsymbol{r}_{k+1}^{T}\left(\boldsymbol{r}_{k+1}-\boldsymbol{r}_{k}\right)}{ \alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{k}} \stackrel{\text { (13.12) }}{=} \frac{\boldsymbol{r}_{k+1}^{T} \boldsymbol{r}_{k+1}}{ \boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}} .`	$\beta_k := -\frac{\boldsymbol{r}_{k+1}^T\boldsymbol{A}\boldsymbol{p}_k}{\boldsymbol{p}_k^T\boldsymbol{A}\boldsymbol{p}_k} \overset{(13.13)}{=} \frac{\boldsymbol{r}_{k+1}^T(\boldsymbol{r}_{k+1}-\boldsymbol{r}_k)}{\alpha_k\boldsymbol{p}_k^T\boldsymbol{A}\boldsymbol{p}_k} \overset{(13.12)}{=} \frac{\boldsymbol{r}_{k+1}^T\boldsymbol{r}_{k+1}}{\boldsymbol{r}_k^T\boldsymbol{r}_k}.$	$\beta_k := -\frac{\boldsymbol{r}_{k+1}^T\boldsymbol{A}\boldsymbol{p}_k}{\boldsymbol{p}_k^T\boldsymbol{A}\boldsymbol{p}_k} \overset{(13.13)}{=} \frac{\boldsymbol{r}_{k+1}^T(\boldsymbol{r}_{k+1}-\boldsymbol{r}_k)}{\alpha_k\boldsymbol{p}_k^T\boldsymbol{A}\boldsymbol{p}_k} \overset{(13.12)}{=} \frac{\boldsymbol{r}_{k+1}^T\boldsymbol{r}_{k+1}}{\boldsymbol{r}_k^T\boldsymbol{r}_k}.$
lyche-numerical-linear-algebra_EQ0387	156	0.846	`\pi_{D_{1}}(\lambda)=\pi_{D_{3}}(\lambda)=\lambda^{2}-4 \lambda+5, \quad \pi_{D_{2}}(\lambda)=\lambda-1,`	$\pi_{D_1}(\lambda)=\pi_{D_3}(\lambda)=\lambda^2-4\lambda+5, \quad \pi_{D_2}(\lambda)=\lambda-1,$	$\pi_{D_1}(\lambda)=\pi_{D_3}(\lambda)=\lambda^2-4\lambda+5, \quad \pi_{D_2}(\lambda)=\lambda-1,$
lyche-numerical-linear-algebra_EQ0650	234	0.847	`\left[\begin{array}{cc} \Sigma_{1} & 0 \\ 0 & 0 \end{array}\right] y=c .`	$\begin{bmatrix} \Sigma_1 & 0 \\ 0 & 0 \end{bmatrix} y = c.$	$\begin{bmatrix} \boldsymbol{\Sigma}_1 & \mathbf{0} \\ \mathbf{0} & \mathbf{0} \end{bmatrix} \boldsymbol{y} = \boldsymbol{c}.$
lyche-numerical-linear-algebra_EQ0034	33	0.848	`C=C I=C(A B)=(C A) B=I B=B`	$C = CI = C(AB) = (CA)B = IB = B$	$\boldsymbol{C} = \boldsymbol{C}\boldsymbol{I} = \boldsymbol{C}(\boldsymbol{A}\boldsymbol{B}) = (\boldsymbol{C}\boldsymbol{A})\boldsymbol{B} = \boldsymbol{I}\boldsymbol{B} = \boldsymbol{B}$
lyche-numerical-linear-algebra_EQ0084 (2.6)	50	0.850	`p_{i}\left(x_{i}\right)=y_{i}, \quad p_{i}\left(x_{i+1} \right)=y_{i+1}, \quad p_{i}^{\prime \prime}\left(x_{i} \right)=\mu_{i}, \quad p_{i}^{\prime \prime}\left(x_{i+1} \right)=\mu_{i+1} .`	$p_i(x_i) = y_i, \quad p_i(x_{i+1}) = y_{i+1}, \quad p_i''(x_i) = \mu_i, \quad p_i''(x_{i+1}) = \mu_{i+1}.$	$p_i(x_i) = y_i, \ p_i(x_{i+1}) = y_{i+1}, \quad p_i''(x_i) = \mu_i, \ p_i''(x_{i+1}) = \mu_{i+1}.$
lyche-numerical-linear-algebra_EQ0409	163	0.850	`\boldsymbol{A}=\left[\begin{array}{cc} a & 1 \\ 0 & a \end{array}\right]`	$\boldsymbol{A} = \begin{bmatrix} a & 1 \\ 0 & a \end{bmatrix}$	$\boldsymbol{A} = \begin{bmatrix} a & 1 \\ 0 & a \end{bmatrix}$

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lyche-numerical-linear-algebra_EQ0144	65	0.853	\boldsymbol{B} \boldsymbol{A}=\left[\begin{array}{ll} \boldsymbol{B}_{11} & \boldsymbol{B}_{12} \\ \boldsymbol{B}_{21} & \boldsymbol{B}_{22} \end{array} \right]\left[\begin{array}{cc} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \mathbf{0} & \boldsymbol{A}_{22} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{I} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{I} \end{array} \right]=\boldsymbol{I}	$\boldsymbol{B}\boldsymbol{A}=\left[\begin{array}{ll} \boldsymbol{B}_{11} & \boldsymbol{B}_{12} \\ \boldsymbol{B}_{21} & \boldsymbol{B}_{22} \end{array} \right]\left[\begin{array}{cc} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \mathbf{0} & \boldsymbol{A}_{22} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{I} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{I} \end{array} \right]=\boldsymbol{I}$	$\boldsymbol{B}\boldsymbol{A}=\left[\begin{array}{ll} \boldsymbol{B}_{11} & \boldsymbol{B}_{12} \\ \boldsymbol{B}_{21} & \boldsymbol{B}_{22} \end{array} \right]\left[\begin{array}{cc} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \mathbf{0} & \boldsymbol{A}_{22} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{I} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{I} \end{array} \right]=\boldsymbol{I}$
lyche-numerical-linear-algebra_EQ0264 (4.8)	109	0.854	\boldsymbol{A}=\left[\begin{array}{ll} \alpha & \boldsymbol{v}^{*} \\ \boldsymbol{v} & \boldsymbol{B} \end{array}\right], \quad \alpha \in \mathbb{C}, \quad \boldsymbol{v} \in \mathbb{C}^{n-1}, \quad \boldsymbol{B} \in \mathbb{C}^{(n-1)\times(n-1)} .	$\boldsymbol{A}=\left[\begin{array}{ll} \alpha & \boldsymbol{v}^{*} \\ \boldsymbol{v} & \boldsymbol{B} \end{array}\right], \quad \alpha \in \mathbb{C}, \quad \boldsymbol{v} \in \mathbb{C}^{n-1}, \quad \boldsymbol{B} \in \mathbb{C}^{(n-1)\times(n-1)} .$	$\boldsymbol{A}=\left[\begin{array}{ll} \alpha & \boldsymbol{v}^{*} \\ \boldsymbol{v} & \boldsymbol{B} \end{array}\right], \quad \alpha \in \mathbb{C}, \quad \boldsymbol{v} \in \mathbb{C}^{n-1}, \quad \boldsymbol{B} \in \mathbb{C}^{(n-1)\times(n-1)} .$
lyche-numerical-linear-algebra_EQ0392	157	0.857	\max _{\substack{x \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x}) \geq R(\boldsymbol{y})= \sum_{j=1}^{n} \lambda_{j}\left|c_{j}\right|^{2}= \sum_{j=1}^{k} \lambda_{j}\left|c_{j}\right|^{2} \geq \sum_{j=1}^{k} \lambda_{k}\left|c_{j}\right|^{2}= \lambda_{k},	$\max_{\substack{x \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x}) \geq R(\boldsymbol{y})= \sum_{j=1}^{n} \lambda_{j}\left\|c_{j}\right\|^{2}= \sum_{j=1}^{k} \lambda_{j}\left\|c_{j}\right\|^{2} \geq \sum_{j=1}^{k} \lambda_{k}\left\|c_{j}\right\|^{2}= \lambda_{k},$	$\max_{\substack{x \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x}) \geq R(\boldsymbol{y})= \sum_{j=1}^{n} \lambda_{j}\left\|c_{j}\right\|^{2}= \sum_{j=1}^{k} \lambda_{j}\left\|c_{j}\right\|^{2} \geq \sum_{j=1}^{k} \lambda_{k}\left\|c_{j}\right\|^{2}= \lambda_{k},$
lyche-numerical-linear-algebra_EQ0032	32	0.859	\boldsymbol{B} z=\left[\begin{array}{ll} \boldsymbol{A} & \boldsymbol{b} \end{array}\right]\left[\begin{array}{c} \tilde{\boldsymbol{z}} \\ z_{n+1} \end{array}\right]= \boldsymbol{A} \tilde{\boldsymbol{z}}+z_{n+1} \boldsymbol{b}=\mathbf{0} .	$\boldsymbol{B} z=\left[\begin{array}{ll} \boldsymbol{A} & \boldsymbol{b} \end{array}\right]\left[\begin{array}{c} \tilde{\boldsymbol{z}} \\ z_{n+1} \end{array}\right]= \boldsymbol{A} \tilde{\boldsymbol{z}}+z_{n+1} \boldsymbol{b}=\mathbf{0} .$	$\boldsymbol{B} z=\left[\begin{array}{ll} \boldsymbol{A} & \boldsymbol{b} \end{array}\right]\left[\begin{array}{c} \tilde{\boldsymbol{z}} \\ z_{n+1} \end{array}\right]= \boldsymbol{A} \tilde{\boldsymbol{z}}+z_{n+1} \boldsymbol{b}=\mathbf{0} .$
lyche-numerical-linear-algebra_EQ0891 (13.36)	307	0.859	1 \leq \frac{\left(\boldsymbol{y}^{T} \boldsymbol{A y} \right)\left(\boldsymbol{y}^{T} \boldsymbol{A}^{-1} \boldsymbol{y}\right)}{\left(\boldsymbol{y}^{T} \boldsymbol{y}\right)^{2}} \leq \frac{(M+m)^{2}}{4 M m} \quad \boldsymbol{y} \neq \mathbf{0}, \boldsymbol{y} \in \mathbb{R}^{n},	$1 \leq \frac{\left(\boldsymbol{y}^{T} \boldsymbol{A y}\right)\left(\boldsymbol{y}^{T} \boldsymbol{A}^{-1} \boldsymbol{y}\right)}{\left(\boldsymbol{y}^{T} \boldsymbol{y}\right)^{2}} \leq \frac{(M+m)^{2}}{4 M m} \quad \boldsymbol{y} \neq \mathbf{0}, \boldsymbol{y} \in \mathbb{R}^{n},$	$1 \leq \frac{\left(\boldsymbol{y}^{T} \boldsymbol{A y}\right)\left(\boldsymbol{y}^{T} \boldsymbol{A}^{-1} \boldsymbol{y}\right)}{\left(\boldsymbol{y}^{T} \boldsymbol{y}\right)^{2}} \leq \frac{(M+m)^{2}}{4 M m} \quad \boldsymbol{y} \neq \mathbf{0}, \boldsymbol{y} \in \mathbb{R}^{n},$
lyche-numerical-linear-algebra_EQ0033	33	0.860	\boldsymbol{A} \boldsymbol{x}=-\boldsymbol{A}\left(\frac{\tilde{\boldsymbol{z}}}{z_{n+1}}\right)=- \frac{1}{z_{n+1}} \boldsymbol{A} \tilde{\boldsymbol{z}}=- \frac{1}{z_{n+1}}\left(-z_{n+1} \boldsymbol{b}\right)= \boldsymbol{b},	$\boldsymbol{A} \boldsymbol{x}=-\boldsymbol{A}\left(\frac{\tilde{\boldsymbol{z}}}{z_{n+1}}\right)=- \frac{1}{z_{n+1}} \boldsymbol{A} \tilde{\boldsymbol{z}}=- \frac{1}{z_{n+1}}\left(-z_{n+1} \boldsymbol{b}\right)= \boldsymbol{b},$	$\boldsymbol{A} \boldsymbol{x}=-\boldsymbol{A}\left(\frac{\tilde{\boldsymbol{z}}}{z_{n+1}}\right)=- \frac{1}{z_{n+1}} \boldsymbol{A} \tilde{\boldsymbol{z}}=- \frac{1}{z_{n+1}}\left(-z_{n+1} \boldsymbol{b}\right)= \boldsymbol{b},$
lyche-numerical-linear-algebra_EQ0451	180	0.869	\boldsymbol{p}_{i}=\left[\begin{array}{c} \boldsymbol{u}_{i} \\ \boldsymbol{v}_{i} \end{array} \right], \quad \boldsymbol{q}_{i}=\left[\begin{array}{c} \boldsymbol{u}_{i} \\ -\boldsymbol{v}_{i} \end{array} \right], \quad \boldsymbol{r}_{j}=\left[\begin{array}{c} \boldsymbol{u}_{j} \\ \mathbf{0} \end{array}\right], \text { for } i=1, \ldots, n, j=n+1, \ldots, m .	$\boldsymbol{p}_{i}=\left[\begin{array}{c} \boldsymbol{u}_{i} \\ \boldsymbol{v}_{i} \end{array} \right], \quad \boldsymbol{q}_{i}=\left[\begin{array}{c} \boldsymbol{u}_{i} \\ -\boldsymbol{v}_{i} \end{array} \right], \quad \boldsymbol{r}_{j}=\left[\begin{array}{c} \boldsymbol{u}_{j} \\ \mathbf{0} \end{array}\right], \text { for } i=1, \ldots, n, j=n+1, \ldots, m.$	$\boldsymbol{p}_{i}=\left[\begin{array}{c} \boldsymbol{u}_{i} \\ \boldsymbol{v}_{i} \end{array} \right], \quad \boldsymbol{q}_{i}=\left[\begin{array}{c} \boldsymbol{u}_{i} \\ -\boldsymbol{v}_{i} \end{array} \right], \quad \boldsymbol{r}_{j}=\left[\begin{array}{c} \boldsymbol{u}_{j} \\ \mathbf{0} \end{array}\right], \text { for } i=1, \ldots, n, j=n+1, \ldots, m.$
lyche-numerical-linear-algebra_EQ0835 (13.1)	290	0.869	\langle\boldsymbol{x}, \boldsymbol{y}\rangle_{ \boldsymbol{A}}:=\boldsymbol{x}^{T} \boldsymbol{A} \boldsymbol{y}, \quad\\|\boldsymbol{y}\\|_{ \boldsymbol{A}}:=\sqrt{\boldsymbol{y}^{T} \boldsymbol{A} \boldsymbol{y}}, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n} .	$\langle\boldsymbol{x}, \boldsymbol{y}\rangle_{ \boldsymbol{A}}:=\boldsymbol{x}^{T} \boldsymbol{A} \boldsymbol{y}, \quad\\|\boldsymbol{y}\\|_{ \boldsymbol{A}}:=\sqrt{\boldsymbol{y}^{T} \boldsymbol{A} \boldsymbol{y}}, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n} .$	$\langle\boldsymbol{x}, \boldsymbol{y}\rangle_{ \boldsymbol{A}}:=\boldsymbol{x}^{T} \boldsymbol{A} \boldsymbol{y}, \quad\\|\boldsymbol{y}\\|_{ \boldsymbol{A}}:=\sqrt{\boldsymbol{y}^{T} \boldsymbol{A} \boldsymbol{y}}, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n} .$

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lyche-numerical-linear-algebra_EQ0910 (13.46)	310	0.869	\begin{aligned} & \left|\boldsymbol{\epsilon}_{k}\right|_{2}^{2}-\left|\boldsymbol{\epsilon}_{k+1}\right|_{2}^{2}=\alpha_{k}\left(2 \boldsymbol{p}_{k}^{T} \boldsymbol{\epsilon}_{k+1}+\alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k}\right) \\ & \quad \stackrel{\text { (13.41) }}{=} \alpha_{k}\left(2 \sum_{i=k+1}^{m} \alpha_{i} \boldsymbol{p}_{i}^{T} \boldsymbol{p}_{k}+\alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k}\right)=\left(\sum_{i=k}^{m}+ \sum_{i=k+1}^{m}\right) \alpha_{k} \alpha_{i} \boldsymbol{p}_{i}^{T} \boldsymbol{p}_{k} \\ & \quad \stackrel{\text { (13.43) }}{=}\left(\sum_{i=k}^{m}+ \sum_{i=k+1}^{m}\right) \frac{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}}{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{k}} \frac{\boldsymbol{r}_{i}^{T} \boldsymbol{r}_{i}}{\boldsymbol{p}_{i}^{T} \boldsymbol{A} \boldsymbol{p}_{i}} \frac{\boldsymbol{r}_{i}^{T} \boldsymbol{r}_{i}}{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}} \boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k} \\ & \quad \stackrel{\text { (13.42) }}{=} \frac{\left|\boldsymbol{p}_{k}\right|_{2}^{2}}{\left|\boldsymbol{p}_{k}\right|_{\boldsymbol{A}}^{2}}\left(\left|\boldsymbol{\epsilon}_{k}\right|_{\boldsymbol{A}}^{2}+\left|\boldsymbol{\epsilon}_{k+1}\right|_{\boldsymbol{A}}^{2}\right) . \end{aligned}	$\begin{aligned} & \left\|\boldsymbol{\epsilon}_{k}\right\|_{2}^{2}-\left\|\boldsymbol{\epsilon}_{k+1}\right\|_{2}^{2}=\alpha_{k}\left(2 \boldsymbol{p}_{k}^{T} \boldsymbol{\epsilon}_{k+1}+\alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k}\right) \\ & \quad \stackrel{\text { (13.41) }}{=} \alpha_{k}\left(2 \sum_{i=k+1}^{m} \alpha_{i} \boldsymbol{p}_{i}^{T} \boldsymbol{p}_{k}+\alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k}\right)=\left(\sum_{i=k}^{m}+ \sum_{i=k+1}^{m}\right) \alpha_{k} \alpha_{i} \boldsymbol{p}_{i}^{T} \boldsymbol{p}_{k} \\ & \quad \stackrel{\text { (13.43) }}{=}\left(\sum_{i=k}^{m}+ \sum_{i=k+1}^{m}\right) \frac{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}}{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{k}} \frac{\boldsymbol{r}_{i}^{T} \boldsymbol{r}_{i}}{\boldsymbol{p}_{i}^{T} \boldsymbol{A} \boldsymbol{p}_{i}} \frac{\boldsymbol{r}_{i}^{T} \boldsymbol{r}_{i}}{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}} \boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k} \\ & \quad \stackrel{\text { (13.42) }}{=} \frac{\left\|\boldsymbol{p}_{k}\right\|_{2}^{2}}{\left\|\boldsymbol{p}_{k}\right\|_{\boldsymbol{A}}^{2}}\left(\left\|\boldsymbol{\epsilon}_{k}\right\|_{\boldsymbol{A}}^{2}+\left\|\boldsymbol{\epsilon}_{k+1}\right\|_{\boldsymbol{A}}^{2}\right) . \end{aligned}$	$\begin{aligned} & \left\|\boldsymbol{\epsilon}_{k}\right\|_{2}^{2}-\left\|\boldsymbol{\epsilon}_{k+1}\right\|_{2}^{2}=\alpha_{k}\left(2 \boldsymbol{p}_{k}^{T} \boldsymbol{\epsilon}_{k+1}+\alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k}\right) \\ & \quad \stackrel{\text { (13.41) }}{=} \alpha_{k}\left(2 \sum_{i=k+1}^{m} \alpha_{i} \boldsymbol{p}_{i}^{T} \boldsymbol{p}_{k}+\alpha_{k} \boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k}\right)=\left(\sum_{i=k}^{m}+ \sum_{i=k+1}^{m}\right) \alpha_{k} \alpha_{i} \boldsymbol{p}_{i}^{T} \boldsymbol{p}_{k} \\ & \quad \stackrel{\text { (13.43) }}{=}\left(\sum_{i=k}^{m}+ \sum_{i=k+1}^{m}\right) \frac{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}}{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{k}} \frac{\boldsymbol{r}_{i}^{T} \boldsymbol{r}_{i}}{\boldsymbol{p}_{i}^{T} \boldsymbol{A} \boldsymbol{p}_{i}} \frac{\boldsymbol{r}_{i}^{T} \boldsymbol{r}_{i}}{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}} \boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k} \\ & \quad \stackrel{\text { (13.42) }}{=} \frac{\left\|\boldsymbol{p}_{k}\right\|_{2}^{2}}{\left\|\boldsymbol{p}_{k}\right\|_{\boldsymbol{A}}^{2}}\left(\left\|\boldsymbol{\epsilon}_{k}\right\|_{\boldsymbol{A}}^{2}+\left\|\boldsymbol{\epsilon}_{k+1}\right\|_{\boldsymbol{A}}^{2}\right) . \end{aligned}$
lyche-numerical-linear-algebra_EQ1014 (15.1)	344	0.870	\boldsymbol{z}_{k}:=\boldsymbol{A}^{k} \boldsymbol{z}_{0}=\boldsymbol{A} \boldsymbol{z}_{k-1}, \quad k=1,2, \ldots .	$\boldsymbol{z}_{k}:=\boldsymbol{A}^{k} \boldsymbol{z}_{0}=\boldsymbol{A} \boldsymbol{z}_{k-1}, \quad k=1,2, \ldots .$	$\boldsymbol{z}_{k}:=\boldsymbol{A}^{k} \boldsymbol{z}_{0}=\boldsymbol{A} \boldsymbol{z}_{k-1}, \quad k=1,2, \ldots .$
lyche-numerical-linear-algebra_EQ0591	218	0.877	E(\boldsymbol{x}):=\\|\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b}\\|_{2}^{2}=(\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b})^{*}(\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b})=\boldsymbol{x}^{*} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{x}-2 \boldsymbol{x}^{*} \boldsymbol{A}^{*} \boldsymbol{b}+\boldsymbol{b}^{*} \boldsymbol{b} .	$E(\boldsymbol{x}):=\\|\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b}\\|_{2}^{2}=(\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b})^{*}(\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b})=\boldsymbol{x}^{*} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{x}-2 \boldsymbol{x}^{*} \boldsymbol{A}^{*} \boldsymbol{b}+\boldsymbol{b}^{*} \boldsymbol{b} .$	$E(\boldsymbol{x}):=\\|\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b}\\|_{2}^{2}=(\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b})^{*}(\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b})=\boldsymbol{x}^{*} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{x}-2 \boldsymbol{x}^{*} \boldsymbol{A}^{*} \boldsymbol{b}+\boldsymbol{b}^{*} \boldsymbol{b} .$
lyche-numerical-linear-algebra_EQ0181	78	0.880	[1],[5],[9],\left[\begin{array}{ll} 1 & 2 \\ 4 & 5 \end{array}\right],\left[\begin{array}{ll} 1 & 3 \\ 7 & 9 \end{array}\right],\left[\begin{array}{ll} 5 & 6 \\ 8 & 9 \end{array}\right], \boldsymbol{A} .	$[1],[5],[9],\left[\begin{array}{ll} 1 & 2 \\ 4 & 5 \end{array}\right],\left[\begin{array}{ll} 1 & 3 \\ 7 & 9 \end{array}\right],\left[\begin{array}{ll} 5 & 6 \\ 8 & 9 \end{array}\right], \boldsymbol{A} .$	$[1],[5],[9],\left[\begin{array}{ll} 1 & 2 \\ 4 & 5 \end{array}\right],\left[\begin{array}{ll} 1 & 3 \\ 7 & 9 \end{array}\right],\left[\begin{array}{ll} 5 & 6 \\ 8 & 9 \end{array}\right], \boldsymbol{A} .$

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lyche-numerical-linear-algebra_EQ0323	132	0.881	\boldsymbol{A}=\left[\begin{array}{rrr} 1 & 3 & 1 \\ 1 & 3 & 7 \\ 1 & -1 & -4 \\ 1 & -1 & 2 \end{array}\right]= \frac{1}{2}\left[\begin{array}{rrrr} 1 & 1 & -1 & -1 \\ 1 & 1 & 1 & 1 \\ 1 & -1 & -1 & 1 \\ 1 & -1 & 1 & -1 \end{array}\right] \times\left[\begin{array}{lll} 2 & 2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 6 \\ 0 & 0 & 0 \end{array}\right]=\boldsymbol{Q} \boldsymbol{R} .	$\boldsymbol{A}=\left[\begin{array}{rrr} 1 & 3 & 1 \\ 1 & 3 & 7 \\ 1 & -1 & -4 \\ 1 & -1 & 2 \end{array}\right]=\frac{1}{2}\left[\begin{array}{rrrr} 1 & 1 & -1 & -1 \\ 1 & 1 & 1 & 1 \\ 1 & -1 & -1 & 1 \\ 1 & -1 & 1 & -1 \end{array}\right] \times\left[\begin{array}{lll} 2 & 2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 6 \\ 0 & 0 & 0 \end{array}\right]=\boldsymbol{Q} \boldsymbol{R}.$	$\boldsymbol{A}=\left[\begin{array}{rrr} 1 & 3 & 1 \\ 1 & 3 & 7 \\ 1 & -1 & -4 \\ 1 & -1 & 2 \end{array}\right]=\frac{1}{2}\left[\begin{array}{rrrr} 1 & 1 & -1 & -1 \\ 1 & 1 & 1 & 1 \\ 1 & -1 & -1 & 1 \\ 1 & -1 & 1 & -1 \end{array}\right] \times\left[\begin{array}{lll} 2 & 2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 6 \\ 0 & 0 & 0 \end{array}\right]=\boldsymbol{Q} \boldsymbol{R}.$
lyche-numerical-linear-algebra_EQ0314	127	0.884	\boldsymbol{H} \boldsymbol{x}=\left[\begin{array}{c} \boldsymbol{y} \\ a \boldsymbol{e}_{1} \end{array} \right], \text { where } \boldsymbol{H}:=\boldsymbol{I}- \boldsymbol{u} \boldsymbol{u}^{*}=\left[\begin{array}{cc} \boldsymbol{I} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{I} \end{array}\right]-\left[\begin{array}{c} \mathbf{0} \\ \hat{\boldsymbol{u}} \end{array} \right]\left[\begin{array}{ll} \mathbf{0} & \hat{ \boldsymbol{u}}^{*} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{I} & \mathbf{0} \\ \mathbf{0} & \hat{\boldsymbol{H}} \end{array}\right],	$\boldsymbol{H} \boldsymbol{x}=\left[\begin{array}{c} \boldsymbol{y} \\ a \boldsymbol{e}_{1} \end{array}\right], \text{ where } \boldsymbol{H}:=\boldsymbol{I}-\boldsymbol{u} \boldsymbol{u}^{*}=\left[\begin{array}{cc} \boldsymbol{I} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{I} \end{array}\right]-\left[\begin{array}{c} \mathbf{0} \\ \hat{\boldsymbol{u}} \end{array}\right]\left[\begin{array}{ll} \mathbf{0} & \hat{\boldsymbol{u}}^{*} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{I} & \mathbf{0} \\ \mathbf{0} & \hat{\boldsymbol{H}} \end{array}\right],$	$\boldsymbol{H} \boldsymbol{x}=\left[\begin{array}{c} \boldsymbol{y} \\ a \boldsymbol{e}_{1} \end{array}\right], \text{ where } \boldsymbol{H}:=\boldsymbol{I}-\boldsymbol{u} \boldsymbol{u}^{*}=\left[\begin{array}{cc} \boldsymbol{I} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{I} \end{array}\right]-\left[\begin{array}{c} \mathbf{0} \\ \hat{\boldsymbol{u}} \end{array}\right]\left[\begin{array}{ll} \mathbf{0} & \hat{\boldsymbol{u}}^{*} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{I} & \mathbf{0} \\ \mathbf{0} & \hat{\boldsymbol{H}} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0367 (6.5)	150	0.884	\boldsymbol{J}:=\boldsymbol{S}^{-1} \boldsymbol{A} \boldsymbol{S}=\operatorname{diag}\left(\boldsymbol{U}_{1}, \ldots, \boldsymbol{U}_{k}\right), \text { with } \boldsymbol{U}_{i} \in \mathbb{C}^{a_{i} \times a_{i}},	$\boldsymbol{J}:=\boldsymbol{S}^{-1} \boldsymbol{A} \boldsymbol{S}=\operatorname{diag}\left(\boldsymbol{U}_{1}, \ldots, \boldsymbol{U}_{k}\right), \text{ with } \boldsymbol{U}_{i} \in \mathbb{C}^{a_{i} \times a_{i}},$	$\boldsymbol{J}:=\boldsymbol{S}^{-1} \boldsymbol{A} \boldsymbol{S}=\operatorname{diag}\left(\boldsymbol{U}_{1}, \ldots, \boldsymbol{U}_{k}\right), \text{ with } \boldsymbol{U}_{i} \in \mathbb{C}^{a_{i} \times a_{i}},$
lyche-numerical-linear-algebra_EQ0594 (9.5)	219	0.885	\left\{\boldsymbol{x} \in \mathbb{C}^{n}: \boldsymbol{A} \boldsymbol{x}=\boldsymbol{b}_{1}\right\} .	$\left\{\boldsymbol{x} \in \mathbb{C}^{n}: \boldsymbol{A} \boldsymbol{x}=\boldsymbol{b}_{1}\right\}.$	$\left\{\boldsymbol{x} \in \mathbb{C}^{n}: \boldsymbol{A} \boldsymbol{x}=\boldsymbol{b}_{1}\right\}.$
lyche-numerical-linear-algebra_EQ0064	42	0.887	\boldsymbol{A}=\left[\begin{array}{ccc} 2 & -6 & 3 \\ 3 & -2 & -6 \\ 6 & 3 & 2 \end{array}\right],	$\boldsymbol{A}=\left[\begin{array}{ccc} 2 & -6 & 3 \\ 3 & -2 & -6 \\ 6 & 3 & 2 \end{array}\right],$	$\boldsymbol{A}=\left[\begin{array}{ccc} 2 & -6 & 3 \\ 3 & -2 & -6 \\ 6 & 3 & 2 \end{array}\right],$
lyche-numerical-linear-algebra_EQ0977	330	0.892	\begin{gathered} \left\\|(\mu \boldsymbol{I}- \boldsymbol{A}) \boldsymbol{u}_{1}\right\\|_{2}=\left \\|(\boldsymbol{A}+\boldsymbol{E}) \boldsymbol{u}_{1}- \boldsymbol{A} \boldsymbol{u}_{1}\right\\|_{2}=\left \\|\boldsymbol{E} \boldsymbol{u}_{1}\right\\|_{2} \leq \\|\boldsymbol{E}\\|_{2}, \\ \prod_{j=2}^{n}\left\\|(\mu \boldsymbol{I}-\boldsymbol{A}) \boldsymbol{u}_{j} \right\\|_{2} \leq \prod_{j=2}^{n}\left(|\mu|+\left\\| \boldsymbol{A} \boldsymbol{u}_{j}\right\\|_{2}\right) \leq\left(\left\\|(\boldsymbol{A}+\boldsymbol{E})\right\\|_{2}+| \boldsymbol{A}\\|_{2}\right)^{n-1} . \end{gathered}	$\begin{gathered} \|(\mu \boldsymbol{I}-\boldsymbol{A}) \boldsymbol{u}_{1}\|_{2}=\|(\boldsymbol{A}+\boldsymbol{E}) \boldsymbol{u}_{1}-\boldsymbol{A} \boldsymbol{u}_{1}\|_{2}=\|\boldsymbol{E} \boldsymbol{u}_{1}\|_{2} \leq\|\boldsymbol{E}\|_{2}, \\ \prod_{j=2}^{n}\|(\mu \boldsymbol{I}-\boldsymbol{A}) \boldsymbol{u}_{j}\|_{2} \leq \prod_{j=2}^{n}\left(|\mu|+\|\boldsymbol{A} \boldsymbol{u}_{j}\|_{2}\right) \leq\left(\|(\boldsymbol{A}+\boldsymbol{E})\|_{2}+\|\boldsymbol{A}\|_{2}\right)^{n-1} . \end{gathered}$	$\begin{gathered} \|(\mu \boldsymbol{I}-\boldsymbol{A}) \boldsymbol{u}_{1}\|_{2}=\|(\boldsymbol{A}+\boldsymbol{E}) \boldsymbol{u}_{1}-\boldsymbol{A} \boldsymbol{u}_{1}\|_{2}=\|\boldsymbol{E} \boldsymbol{u}_{1}\|_{2} \leq\|\boldsymbol{E}\|_{2}, \\ \prod_{j=2}^{n}\|(\mu \boldsymbol{I}-\boldsymbol{A}) \boldsymbol{u}_{j}\|_{2} \leq \prod_{j=2}^{n}\left(|\mu|+\|\boldsymbol{A} \boldsymbol{u}_{j}\|_{2}\right) \leq\left(\|(\boldsymbol{A}+\boldsymbol{E})\|_{2}+\|\boldsymbol{A}\|_{2}\right)^{n-1} . \end{gathered}$
lyche-numerical-linear-algebra_EQ0147	66	0.896	\left[\begin{array}{cc} \boldsymbol{A}_{11}^{-1} & -\boldsymbol{A}_{11}^{-1} \boldsymbol{A}_{12} \boldsymbol{A}_{22}^{-1} \\ \mathbf{0} & \boldsymbol{A}_{22}^{-1} \end{array}\right] \left[\begin{array}{cc} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \mathbf{0} & \boldsymbol{A}_{22} \end{array}\right]=\left[\begin{array}{ll} \boldsymbol{I} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{I} \end{array}\right]=\boldsymbol{I}	$\left[\begin{array}{cc} \boldsymbol{A}_{11}^{-1} & -\boldsymbol{A}_{11}^{-1} \boldsymbol{A}_{12} \boldsymbol{A}_{22}^{-1} \\ \mathbf{0} & \boldsymbol{A}_{22}^{-1} \end{array}\right] \left[\begin{array}{cc} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \mathbf{0} & \boldsymbol{A}_{22} \end{array}\right]=\left[\begin{array}{ll} \boldsymbol{I} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{I} \end{array}\right]=\boldsymbol{I}$	$\left[\begin{array}{cc} \boldsymbol{A}_{11}^{-1} & -\boldsymbol{A}_{11}^{-1} \boldsymbol{A}_{12} \boldsymbol{A}_{22}^{-1} \\ \mathbf{0} & \boldsymbol{A}_{22}^{-1} \end{array}\right] \left[\begin{array}{cc} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \mathbf{0} & \boldsymbol{A}_{22} \end{array}\right]=\left[\begin{array}{ll} \boldsymbol{I} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{I} \end{array}\right]=\boldsymbol{I}$

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lyche-numerical-linear-algebra_EQ0825	286	0.896	`\rho\left(\boldsymbol{G}_{J}\right)=\sqrt{\left|a_{21} a_{12} / a_{11} a_{22}\right|} .`	$\rho\left(\boldsymbol{G}_J\right)=\sqrt{\left\|a_{21} a_{12} / a_{11} a_{22}\right\|}$.	$\rho\left(\boldsymbol{G}_J\right)=\sqrt{\left\|a_{21} a_{12} / a_{11} a_{22}\right\|}$.
lyche-numerical-linear-algebra_EQ0989	333	0.899	`\boldsymbol{A}_{k}=\left[\begin{array}{ll} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \\ \boldsymbol{D}_{k} & \boldsymbol{E}_{k} \end{array} \right] .`	$\boldsymbol{A}_k=\left[\begin{array}{ll} \boldsymbol{B}_k & \boldsymbol{C}_k \\ \boldsymbol{D}_k & \boldsymbol{E}_k \end{array}\right]$.	$\boldsymbol{A}_k=\left[\begin{array}{ll} \boldsymbol{B}_k & \boldsymbol{C}_k \\ \boldsymbol{D}_k & \boldsymbol{E}_k \end{array}\right]$.
lyche-numerical-linear-algebra_EQ0024 (1.9)	29	0.902	`\boldsymbol{s}_{j}=\sum_{i=1}^{m} a_{i j} \boldsymbol{v}_{i} \text { for } j=1, \ldots, n .`	$\boldsymbol{s}_j=\sum_{i=1}^{m} a_{ij} \boldsymbol{v}_i \text{ for } j=1, \ldots, n$.	$\boldsymbol{s}_j=\sum_{i=1}^{m} a_{ij} \boldsymbol{v}_i \text{ for } j=1, \ldots, n$.
lyche-numerical-linear-algebra_EQ0614	225	0.902	`\boldsymbol{A}=\left[\begin{array}{ll} 1 & 1 \\ 0 & 1 \\ 0 & 0 \end{array}\right], \quad \boldsymbol{b}=\left[ \begin{array}{c} 10^{-4} \\ 0 \\ 1 \end{array}\right], \quad \boldsymbol{e}=\left[\begin{array}{c} 10^{-6} \\ 0 \\ 0 \end{array}\right] .`	$\boldsymbol{A}=\left[\begin{array}{ll} 1 & 1 \\ 0 & 1 \\ 0 & 0 \end{array}\right], \quad \boldsymbol{b}=\left[\begin{array}{c} 10^{-4} \\ 0 \\ 1 \end{array}\right], \quad \boldsymbol{e}=\left[\begin{array}{c} 10^{-6} \\ 0 \\ 0 \end{array}\right]$.	$\boldsymbol{A}=\left[\begin{array}{ll} 1 & 1 \\ 0 & 1 \\ 0 & 0 \end{array}\right], \quad \boldsymbol{b}=\left[\begin{array}{c} 10^{-4} \\ 0 \\ 1 \end{array}\right], \quad \boldsymbol{e}=\left[\begin{array}{c} 10^{-6} \\ 0 \\ 0 \end{array}\right]$.
lyche-numerical-linear-algebra_EQ0168	74	0.904	`\boldsymbol{A}:=\left[\begin{array}{ll} \lambda & \boldsymbol{a}^{T} \\ \mathbf{0} & \boldsymbol{A}_{1} \end{array}\right], \quad \boldsymbol{B}:=\left[\begin{array}{ll} 1 & \mathbf{0}^{T} \\ \mathbf{0} & \boldsymbol{B}_{1} \end{array}\right], \quad \boldsymbol{C}:=\left[\begin{array}{ll} 1 & \mathbf{0}^{T} \\ \mathbf{0} & \boldsymbol{C}_{1} \end{array}\right],`	$\boldsymbol{A}:=\left[\begin{array}{ll} \lambda & \boldsymbol{a}^T \\ \mathbf{0} & \boldsymbol{A}_1 \end{array}\right], \quad \boldsymbol{B}:=\left[\begin{array}{ll} 1 & \mathbf{0}^T \\ \mathbf{0} & \boldsymbol{B}_1 \end{array}\right], \quad \boldsymbol{C}:=\left[\begin{array}{ll} 1 & \mathbf{0}^T \\ \mathbf{0} & \boldsymbol{C}_1 \end{array}\right],$	$\boldsymbol{A}:=\left[\begin{array}{ll} \lambda & \boldsymbol{a}^T \\ \mathbf{0} & \boldsymbol{A}_1 \end{array}\right], \quad \boldsymbol{B}:=\left[\begin{array}{ll} 1 & \mathbf{0}^T \\ \mathbf{0} & \boldsymbol{B}_1 \end{array}\right], \quad \boldsymbol{C}:=\left[\begin{array}{ll} 1 & \mathbf{0}^T \\ \mathbf{0} & \boldsymbol{C}_1 \end{array}\right],$
lyche-numerical-linear-algebra_EQ0925 (13.55)	314	0.907	`\begin{aligned} & \left(d_{1} v\right)_{j, k}:=c_{j-\frac{1}{2}, k}\left(v_{j, k}-v_{j-1, k}\right)-c_{j+\frac{1}{2}, k}\left(v_{j+1, k}-v_{j, k}\right) \approx-h^{2} \frac{\partial}{\partial x}\left(c \frac{\partial u}{\partial x}\right)_{j, k}, \\ & \left(d_{2} v \right)_{j, k}:=c_{j, k-\frac{1}{2}}\left(v_{j, k}-v_{j, k-1}\right)-c_{j, k+\frac{1}{2}}\left(v_{j, k+1}-v_{j, k}\right) \approx-h^{2} \frac{\partial}{\partial y}\left(c \frac{\partial u}{\partial y}\right)_{j, k}, \end{aligned}`	$\begin{aligned} & \left(d_1 v\right)_{j, k}:=c_{j-\frac{1}{2}, k}\left(v_{j, k}-v_{j-1, k}\right)-c_{j+\frac{1}{2}, k}\left(v_{j+1, k}-v_{j, k}\right) \approx-h^2 \frac{\partial}{\partial x}\left(c \frac{\partial u}{\partial x}\right)_{j, k}, \\ & \left(d_2 v\right)_{j, k}:=c_{j, k-\frac{1}{2}}\left(v_{j, k}-v_{j, k-1}\right)-c_{j, k+\frac{1}{2}}\left(v_{j, k+1}-v_{j, k}\right) \approx-h^2 \frac{\partial}{\partial y}\left(c \frac{\partial u}{\partial y}\right)_{j, k}, \end{aligned}$	$\begin{aligned} & \left(d_1 v\right)_{j, k}:=c_{j-\frac{1}{2}, k}\left(v_{j, k}-v_{j-1, k}\right)-c_{j+\frac{1}{2}, k}\left(v_{j+1, k}-v_{j, k}\right) \approx-h^2 \frac{\partial}{\partial x}\left(c \frac{\partial u}{\partial x}\right)_{j, k}, \\ & \left(d_2 v\right)_{j, k}:=c_{j, k-\frac{1}{2}}\left(v_{j, k}-v_{j, k-1}\right)-c_{j, k+\frac{1}{2}}\left(v_{j, k+1}-v_{j, k}\right) \approx-h^2 \frac{\partial}{\partial y}\left(c \frac{\partial u}{\partial y}\right)_{j, k}, \end{aligned}$
lyche-numerical-linear-algebra_EQ0714 (11.6)	256	0.908	`\boldsymbol{F}_{4}=\left[\begin{array}{cccc} 1 & 1 & 1 & 1 \\ 1 & \omega_{4} & \omega_{4}^{2} & \omega_{4}^{3} \\ 1 & \omega_{4}^{2} & \omega_{4}^{4} & \omega_{4}^{6} \\ 1 & \omega_{4}^{3} & \omega_{4}^{6} & \omega_{4}^{9} \end{array}\right]=\left[\begin{array}{rrrr} 1 & 1 & 1 & 1 \\ 1 & -i & -1 & i \\ 1 & -1 & 1 & -1 \\ 1 & i & -1 & -i \end{array}\right] .`	$\boldsymbol{F}_4=\left[\begin{array}{cccc} 1 & 1 & 1 & 1 \\ 1 & \omega_4 & \omega_4^2 & \omega_4^3 \\ 1 & \omega_4^2 & \omega_4^4 & \omega_4^6 \\ 1 & \omega_4^3 & \omega_4^6 & \omega_4^9 \end{array}\right]=\left[\begin{array}{rrrr} 1 & 1 & 1 & 1 \\ 1 & -i & -1 & i \\ 1 & -1 & 1 & -1 \\ 1 & i & -1 & -i \end{array}\right]$.	$\boldsymbol{F}_4=\left[\begin{array}{cccc} 1 & 1 & 1 & 1 \\ 1 & \omega_4 & \omega_4^2 & \omega_4^3 \\ 1 & \omega_4^2 & \omega_4^4 & \omega_4^6 \\ 1 & \omega_4^3 & \omega_4^6 & \omega_4^9 \end{array}\right]=\left[\begin{array}{rrrr} 1 & 1 & 1 & 1 \\ 1 & -i & -1 & i \\ 1 & -1 & 1 & -1 \\ 1 & i & -1 & -i \end{array}\right]$.

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lyche-numerical-linear-algebra_EQ0488 (8.18)	191	0.909	`\begin{aligned} & \\|\boldsymbol{A}\\|_{1}:=\max _{1 \leq j \leq n}\left\\|\boldsymbol{A} \boldsymbol{e}_{j}\right\\|_{1}=\max _{1 \leq j \leq n} \sum_{k=1}^{m}\left|a_{k, j}\right|, \quad \text { (max column sum) } \\ & \\|\boldsymbol{A}\\|_{2}:=\sigma_{1}, \quad \text { (largest singular value of } \boldsymbol{A} \text {) } \\ & \\|\boldsymbol{A}\\|_{\infty}=\max _{1 \leq k \leq m}\left\\|\boldsymbol{e}_{k}^{T} \boldsymbol{A}\right\\|_{1}=\max _{1 \leq k \leq m} \sum_{j=1}^{n}\left|a_{k, j}\right| . \quad \text { (max row sum) } \end{aligned}`	$\begin{aligned} & \\|\boldsymbol{A}\\|_{1}:=\max _{1 \leq j \leq n}\left\\|\boldsymbol{A} \boldsymbol{e}_{j}\right\\|_{1}=\max _{1 \leq j \leq n} \sum_{k=1}^{m}\left\|a_{k, j}\right\|, \quad \text { (max column sum) } \\ & \\|\boldsymbol{A}\\|_{2}:=\sigma_{1}, \quad \text { (largest singular value of } \boldsymbol{A} \text {) } \\ & \\|\boldsymbol{A}\\|_{\infty}=\max _{1 \leq k \leq m}\left\|\boldsymbol{e}_{k}^{T} \boldsymbol{A}\right\|_{1}=\max _{1 \leq k \leq m} \sum_{j=1}^{n}\left\|a_{k, j}\right\| . \quad \text { (max row sum) } \end{aligned}$	$\begin{aligned} & \\|\boldsymbol{A}\\|_{1}:=\max _{1 \leq j \leq n}\left\\|\boldsymbol{A} \boldsymbol{e}_{j}\right\\|_{1}=\max _{1 \leq j \leq n} \sum_{k=1}^{m}\left\|a_{k, j}\right\|, \quad \text { (max column sum) } \\ & \\|\boldsymbol{A}\\|_{2}:=\sigma_{1}, \quad \text { (largest singular value of } \boldsymbol{A} \text {) } \\ & \\|\boldsymbol{A}\\|_{\infty}=\max _{1 \leq k \leq m}\left\|\boldsymbol{e}_{k}^{T} \boldsymbol{A}\right\|_{1}=\max _{1 \leq k \leq m} \sum_{j=1}^{n}\left\|a_{k, j}\right\| . \quad \text { (max row sum) } \end{aligned}$
lyche-numerical-linear-algebra_EQ0303	124	0.910	`\boldsymbol{H}=\left[\begin{array}{ll} 1 & 0 \\ 0 & 1 \end{array}\right]-\left[\begin{array}{l} u_{1} \\ u_{2} \end{array}\right]\left[\begin{array}{ll} u_{1} & u_{2} \end{array}\right]=\left[\begin{array}{cc} 1-u_{1}^{2} & -u_{1} u_{2} \\ -u_{2} u_{1} & 1-u_{2}^{2} \end{array} \right] .`	$\boldsymbol{H}=\left[\begin{array}{ll} 1 & 0 \\ 0 & 1 \end{array}\right]-\left[\begin{array}{l} u_{1} \\ u_{2} \end{array}\right]\left[\begin{array}{ll} u_{1} & u_{2} \end{array}\right]=\left[\begin{array}{cc} 1-u_{1}^{2} & -u_{1} u_{2} \\ -u_{2} u_{1} & 1-u_{2}^{2} \end{array} \right] .$	$\boldsymbol{H}=\left[\begin{array}{ll} 1 & 0 \\ 0 & 1 \end{array}\right]-\left[\begin{array}{l} u_{1} \\ u_{2} \end{array}\right]\left[\begin{array}{ll} u_{1} & u_{2} \end{array}\right]=\left[\begin{array}{cc} 1-u_{1}^{2} & -u_{1} u_{2} \\ -u_{2} u_{1} & 1-u_{2}^{2} \end{array} \right] .$
lyche-numerical-linear-algebra_EQ0252	103	0.911	`\begin{aligned} z^{*} A z & =(x-i y)^{T} A(x+i y)=x^{T} A x-i y^{T} A x+i x^{T} A y-i^{2} y^{T} A y \\ & =x^{T} A x+y^{T} A y, \end{aligned}`	$\begin{aligned} z^{*} A z & =(x-i y)^{T} A(x+i y)=x^{T} A x-i y^{T} A x+i x^{T} A y-i^{2} y^{T} A y \\ & =x^{T} A x+y^{T} A y, \end{aligned}$	$\begin{aligned} z^{*} A z & =(x-i y)^{T} A(x+i y)=x^{T} A x-i y^{T} A x+i x^{T} A y-i^{2} y^{T} A y \\ & =x^{T} A x+y^{T} A y, \end{aligned}$
lyche-numerical-linear-algebra_EQ0170	75	0.914	`\begin{array}{ll} a_{11}^{(1)} x_{1}+a_{12}^{(1)} x_{2}+a_{13}^{(1)} x_{3}=b_{1}^{(1)}, & \mathrm{I} \\ a_{21}^{(1)} x_{1}+a_{22}^{(1)} x_{2}+a_{23}^{(1)} x_{3}=b_{2}^{(1)}, & \mathrm{II} \\ a_{31}^{(1)} x_{1}+a_{32}^{(1)} x_{2}+a_{33}^{(1)} x_{3}=b_{3}^{(1)} . & \mathrm{III} . \end{array}`	$\begin{array}{ll} a_{11}^{(1)} x_{1}+a_{12}^{(1)} x_{2}+a_{13}^{(1)} x_{3}=b_{1}^{(1)}, & \mathrm{I} \\ a_{21}^{(1)} x_{1}+a_{22}^{(1)} x_{2}+a_{23}^{(1)} x_{3}=b_{2}^{(1)}, & \mathrm{II} \\ a_{31}^{(1)} x_{1}+a_{32}^{(1)} x_{2}+a_{33}^{(1)} x_{3}=b_{3}^{(1)} . & \mathrm{III} . \end{array}$	$\begin{array}{ll} a_{11}^{(1)} x_{1}+a_{12}^{(1)} x_{2}+a_{13}^{(1)} x_{3}=b_{1}^{(1)}, & \mathrm{I} \\ a_{21}^{(1)} x_{1}+a_{22}^{(1)} x_{2}+a_{23}^{(1)} x_{3}=b_{2}^{(1)}, & \mathrm{II} \\ a_{31}^{(1)} x_{1}+a_{32}^{(1)} x_{2}+a_{33}^{(1)} x_{3}=b_{3}^{(1)} . & \mathrm{III} . \end{array}$
lyche-numerical-linear-algebra_EQ0494	194	0.915	`\left\\|\boldsymbol{A}^{*}\right\\|_{F}=\\|\boldsymbol{A}\\|_{F} \text { and }\left\\|\boldsymbol{A}^{*}\right\\|_{2}=\\|\boldsymbol{A}\\|_{2} .`	$\left\\|\boldsymbol{A}^{*}\right\\|_{F}=\\|\boldsymbol{A}\\|_{F} \text { and }\left\\|\boldsymbol{A}^{*}\right\\|_{2}=\\|\boldsymbol{A}\\|_{2} .$	$\left\\|\boldsymbol{A}^{*}\right\\|_{F}=\\|\boldsymbol{A}\\|_{F} \text { and }\left\\|\boldsymbol{A}^{*}\right\\|_{2}=\\|\boldsymbol{A}\\|_{2} .$
lyche-numerical-linear-algebra_EQ0485	191	0.917	`\begin{aligned} & \\|\boldsymbol{A} \boldsymbol{B}\\|=\max _{\boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{A} \boldsymbol{B} \boldsymbol{x}\\|}{\\|\boldsymbol{x}\\|}= \max _{\boldsymbol{B} \boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{A} \boldsymbol{B} \boldsymbol{x}\\|}{ \\|\boldsymbol{x}\\|}=\max _{\boldsymbol{B} \boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{A} \boldsymbol{B} \boldsymbol{x}\\|}{\\|\boldsymbol{B} \boldsymbol{x}\\|} \frac{\\|\boldsymbol{B} \boldsymbol{x}\\|}{\\|\boldsymbol{x} \\|} \\ & \quad \leq \max _{\boldsymbol{y} \neq \mathbf{0}} \frac{\\|\boldsymbol{A} \boldsymbol{y}\\|}{\\|\boldsymbol{y}\\|} \max _{\boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{B} \boldsymbol{x}\\|}{\\|\boldsymbol{x} \\|}=\\|\boldsymbol{A}\\|\\|\boldsymbol{B}\\| \end{aligned}`	$\begin{aligned} & \\|\boldsymbol{A} \boldsymbol{B}\\|=\max _{\boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{A} \boldsymbol{B} \boldsymbol{x}\\|}{\\|\boldsymbol{x}\\|}= \max _{\boldsymbol{B} \boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{A} \boldsymbol{B} \boldsymbol{x}\\|}{ \\|\boldsymbol{x}\\|}=\max _{\boldsymbol{B} \boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{A} \boldsymbol{B} \boldsymbol{x}\\|}{\\|\boldsymbol{B} \boldsymbol{x}\\|} \frac{\\|\boldsymbol{B} \boldsymbol{x}\\|}{\\|\boldsymbol{x} \\|} \\ & \quad \leq \max _{\boldsymbol{y} \neq \mathbf{0}} \frac{\\|\boldsymbol{A} \boldsymbol{y}\\|}{\\|\boldsymbol{y}\\|} \max _{\boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{B} \boldsymbol{x}\\|}{\\|\boldsymbol{x} \\|}=\\|\boldsymbol{A}\\|\\|\boldsymbol{B}\\| \end{aligned}$	$\begin{aligned} & \\|\boldsymbol{A} \boldsymbol{B}\\|=\max _{\boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{A} \boldsymbol{B} \boldsymbol{x}\\|}{\\|\boldsymbol{x}\\|}= \max _{\boldsymbol{B} \boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{A} \boldsymbol{B} \boldsymbol{x}\\|}{ \\|\boldsymbol{x}\\|}=\max _{\boldsymbol{B} \boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{A} \boldsymbol{B} \boldsymbol{x}\\|}{\\|\boldsymbol{B} \boldsymbol{x}\\|} \frac{\\|\boldsymbol{B} \boldsymbol{x}\\|}{\\|\boldsymbol{x} \\|} \\ & \quad \leq \max _{\boldsymbol{y} \neq \mathbf{0}} \frac{\\|\boldsymbol{A} \boldsymbol{y}\\|}{\\|\boldsymbol{y}\\|} \max _{\boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{B} \boldsymbol{x}\\|}{\\|\boldsymbol{x} \\|}=\\|\boldsymbol{A}\\|\\|\boldsymbol{B}\\| \end{aligned}$

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lyche-numerical-linear-algebra_ EQ1022 (15.5)	346	0.918	`\lim _{k \rightarrow \infty} \frac{z_{k}}{ \lambda_{1}^{k}}=c_{1} \boldsymbol{v}_{1},`	$\lim\limits_{k\rightarrow\infty} \frac{z_k}{\lambda_1^k}=c_1 \boldsymbol{v}_1,$	$\lim\limits_{k\rightarrow\infty} \frac{z_k}{\lambda_1^k}=c_1 \boldsymbol{v}_1,$
lyche-numerical-linear-algebra_ EQ0580	215	0.924	`\begin{array}{c|c|c|c|c} t & 1.0 & 2.0 & 3.0 & 4.0 \\ \hline y & 3.1 & 1.8 & 1.0 & 0.1 \end{array}`	$\begin{array}{c\|c\|c\|c\|c} t & 1.0 & 2.0 & 3.0 & 4.0 \\ \hline y & 3.1 & 1.8 & 1.0 & 0.1 \end{array}$	$\begin{array}{c\|c\|c\|c\|c} t & 1.0 & 2.0 & 3.0 & 4.0 \\ \hline y & 3.1 & 1.8 & 1.0 & 0.1 \end{array}$
lyche-numerical-linear-algebra_ EQ0912 (13.45)	310	0.931	`\begin{aligned} A x & =b \\ B A x & =B b \\ \left(C A C^{T}\right) y & =C b, \& x=C^{T} y . \end{aligned}`	$\begin{aligned} A x & =b \\ B A x & =B b \\ \left(C A C^{T}\right) y & =C b, \& x=C^{T} y . \end{aligned}$	$\begin{aligned} \boldsymbol{A x} & =\boldsymbol{b} \\ \boldsymbol{B A x} & =\boldsymbol{B b} \\ \left(\boldsymbol{C A C}^{T}\right) \boldsymbol{y} & =\boldsymbol{C b}, \& \boldsymbol{x}=\boldsymbol{C}^{T} \boldsymbol{y} . \end{aligned}$
lyche-numerical-linear-algebra_ EQ0229 (3.20)	92	0.933	`\boldsymbol{A}=\boldsymbol{L} \boldsymbol{U}= \left[\begin{array}{cccc} \boldsymbol{I} & & & \\ \boldsymbol{L}_{21} & \boldsymbol{I} & & \\ \vdots & & \ddots & \\ \boldsymbol{L}_{m1} & \cdots & \boldsymbol{L}_{m,m-1} & \boldsymbol{I} \end{array} \right]\left[\begin{array}{cccc} \boldsymbol{U}_{11} & & \cdots & \boldsymbol{U}_{1m} \\ & \boldsymbol{U}_{22} & \cdots & \boldsymbol{U}_{2m} \\ & & \ddots & \vdots \\ & & & \boldsymbol{U}_{mm} \end{array}\right]`	$\boldsymbol{A}=\boldsymbol{L} \boldsymbol{U}= \left[\begin{array}{cccc} \boldsymbol{I} & & & \\ \boldsymbol{L}_{21} & \boldsymbol{I} & & \\ \vdots & & \ddots & \\ \boldsymbol{L}_{m1} & \cdots & \boldsymbol{L}_{m,m-1} & \boldsymbol{I} \end{array} \right]\left[\begin{array}{cccc} \boldsymbol{U}_{11} & & \cdots & \boldsymbol{U}_{1m} \\ & \boldsymbol{U}_{22} & \cdots & \boldsymbol{U}_{2m} \\ & & \ddots & \vdots \\ & & & \boldsymbol{U}_{mm} \end{array}\right]$
lyche-numerical-linear-algebra_ EQ0253	103	0.934	`\nabla f(\boldsymbol{x})=\left[\begin{array}{c} \frac{\partial f(\boldsymbol{x})}{\partial x_{1}} \\ \vdots \\ \frac{\partial f(\boldsymbol{x})}{\partial x_{n}} \end{array}\right] \in \mathbb{R}^{n}, \quad H f(\boldsymbol{x})=\left[\begin{array}{ccc} \frac{ \partial^{2} f(\boldsymbol{x})}{\partial x_{1} \partial x_{1}} & \ldots & \frac{\partial^{2} f(\boldsymbol{x})}{ \partial x_{1} \partial x_{n}} \\ \vdots & & \vdots \\ \frac{\partial^{2} f(\boldsymbol{x})}{\partial x_{n} \partial x_{1}} & \ldots & \frac{\partial^{2} f(\boldsymbol{x})}{\partial x_{n} \partial x_{n}} \end{array}\right] \in \mathbb{R}^{n \times n} .`	$\nabla f(\boldsymbol{x})=\left[\begin{array}{c} \frac{\partial f(\boldsymbol{x})}{\partial x_{1}} \\ \vdots \\ \frac{\partial f(\boldsymbol{x})}{\partial x_{n}} \end{array}\right] \in \mathbb{R}^{n}, \quad H f(\boldsymbol{x})=\left[\begin{array}{ccc} \frac{ \partial^{2} f(\boldsymbol{x})}{\partial x_{1} \partial x_{1}} & \ldots & \frac{\partial^{2} f(\boldsymbol{x})}{ \partial x_{1} \partial x_{n}} \\ \vdots & & \vdots \\ \frac{\partial^{2} f(\boldsymbol{x})}{\partial x_{n} \partial x_{1}} & \ldots & \frac{\partial^{2} f(\boldsymbol{x})}{\partial x_{n} \partial x_{n}} \end{array}\right] \in \mathbb{R}^{n \times n} .$
lyche-numerical-linear-algebra_ EQ0659 (10.3)	239	0.934	`\begin{aligned} -\Delta_{h} v_{j, k} & =f_{j, k}, \quad(j h, k h) \in \Omega_{h}, \\ v_{j, k} & =0, \quad(j h, k h) \in \partial \Omega_{h}, \end{aligned}`	$\begin{aligned} -\Delta_{h} v_{j, k} & =f_{j, k}, \quad(j h, k h) \in \Omega_{h}, \\ v_{j, k} & =0, \quad(j h, k h) \in \partial \Omega_{h}, \end{aligned}$	$\begin{aligned} -\Delta_{h} v_{j, k} & =f_{j, k}, \quad(j h, k h) \in \Omega_{h}, \\ v_{j, k} & =0, \quad(j h, k h) \in \partial \Omega_{h}, \end{aligned}$
lyche-numerical-linear-algebra_ EQ0873	303	0.936	`\left\\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\\|_{ \boldsymbol{A}}^{2} \leq\left\\|\boldsymbol{x}- \boldsymbol{x}_{0}-\boldsymbol{w}\right\\|_{ \boldsymbol{A}}^{2} \leq \max _{a \leq x \leq b}|Q(x)|^{2} \sum_{j=1}^{n} \frac{\sigma_{j}^{2}}{ \lambda_{j}}=\max _{a \leq x \leq b}|Q(x)|^{2} \left\\|\boldsymbol{x}-\boldsymbol{x}_{0}\right\\|_{ \boldsymbol{A}}^{2},`	$\left\\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\\|_{ \boldsymbol{A}}^{2} \leq\left\\|\boldsymbol{x}- \boldsymbol{x}_{0}-\boldsymbol{w}\right\\|_{ \boldsymbol{A}}^{2} \leq \max _{a \leq x \leq b}\|Q(x)\|^{2} \sum_{j=1}^{n} \frac{\sigma_{j}^{2}}{ \lambda_{j}}=\max _{a \leq x \leq b}\|Q(x)\|^{2} \left\\|\boldsymbol{x}-\boldsymbol{x}_{0}\right\\|_{ \boldsymbol{A}}^{2},$	$\left\\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\\|_{ \boldsymbol{A}}^{2} \leq\left\\|\boldsymbol{x}- \boldsymbol{x}_{0}-\boldsymbol{w}\right\\|_{ \boldsymbol{A}}^{2} \leq \max _{a \leq x \leq b}\|Q(x)\|^{2} \sum_{j=1}^{n} \frac{\sigma_{j}^{2}}{ \lambda_{j}}=\max _{a \leq x \leq b}\|Q(x)\|^{2} \left\\|\boldsymbol{x}-\boldsymbol{x}_{0}\right\\|_{ \boldsymbol{A}}^{2},$

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lyche-numerical-linear-algebra_EQ1052	359	0.936	`\begin{aligned} & \nabla f(x, y)=\left[\begin{array}{c} 2 x-y \\ -x+2 y \end{array}\right], \quad \nabla^{T} \boldsymbol{g}(x, y)=\left[\begin{array}{cc} 2 x-y-x+2 y \\ 1 & -1 \end{array}\right], \\ & \boldsymbol{H} f(x, y)=\left[\begin{array}{cc} \frac{\partial^{2} f}{\partial x^{2}} & \frac{\partial^{2} f}{\partial x \partial y} \\ \frac{\partial^{2} f}{\partial y \partial x} & \frac{\partial^{2} f}{\partial y^{2}} \end{array}\right]=\left[\begin{array}{rr} 2 & -1 \\ -1 & 2 \end{array}\right] . \end{aligned}`	$\nabla f(x, y)=\left[\begin{array}{c} 2x-y \\ -x+2y \end{array}\right], \quad \nabla^{T} \boldsymbol{g}(x, y)=\left[\begin{array}{cc} 2x-y-x+2y \\ 1 & -1 \end{array}\right],$ $\boldsymbol{H} f(x, y)=\left[\begin{array}{cc} \frac{\partial^{2} f}{\partial x^{2}} & \frac{\partial^{2} f}{\partial x \partial y} \\ \frac{\partial^{2} f}{\partial y \partial x} & \frac{\partial^{2} f}{\partial y^{2}} \end{array}\right]=\left[\begin{array}{rr} 2 & -1 \\ -1 & 2 \end{array}\right] .$	$\nabla f(x, y)=\left[\begin{array}{c} 2x-y \\ -x+2y \end{array}\right], \quad \nabla^{T} \boldsymbol{g}(x, y)=\left[\begin{array}{cc} 2x-y & -x+2y \\ 1 & -1 \end{array}\right],$ $\boldsymbol{H} f(x, y)=\left[\begin{array}{cc} \frac{\partial^{2} f}{\partial x^{2}} & \frac{\partial^{2} f}{\partial x \partial y} \\ \frac{\partial^{2} f}{\partial y \partial x} & \frac{\partial^{2} f}{\partial y^{2}} \end{array}\right]=\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right].$
lyche-numerical-linear-algebra_EQ0782	276	0.938	`\begin{aligned} (\boldsymbol{A} \boldsymbol{x})^{*} \boldsymbol{y}+\boldsymbol{y}^{*}(\lambda \boldsymbol{A} \boldsymbol{x}) & =\boldsymbol{y}^{*}\left(\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{\boldsymbol{R}}\right) \boldsymbol{y}+\boldsymbol{y}^{*}\left(\omega^{-1} \boldsymbol{D}+\boldsymbol{A}_{\boldsymbol{R}}-\boldsymbol{D}\right) \boldsymbol{y} \\ & = \boldsymbol{y}^{*}\left(2 \omega^{-1}-1\right) \boldsymbol{D} \boldsymbol{y}=\omega^{-1}(2-\omega)|1-\lambda|^{2} \boldsymbol{x}^{*} \boldsymbol{D} \boldsymbol{x} . \end{aligned}`	$\begin{aligned} (\boldsymbol{A} \boldsymbol{x})^{*} \boldsymbol{y}+\boldsymbol{y}^{*}(\lambda \boldsymbol{A} \boldsymbol{x}) & =\boldsymbol{y}^{*}\left(\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{\boldsymbol{R}}\right) \boldsymbol{y}+\boldsymbol{y}^{*}\left(\omega^{-1} \boldsymbol{D}+\boldsymbol{A}_{\boldsymbol{R}}-\boldsymbol{D}\right) \boldsymbol{y} \\ & = \boldsymbol{y}^{*}\left(2 \omega^{-1}-1\right) \boldsymbol{D} \boldsymbol{y}=\omega^{-1}(2-\omega)|1-\lambda|^{2} \boldsymbol{x}^{*} \boldsymbol{D} \boldsymbol{x} . \end{aligned}$	$\begin{aligned} (\boldsymbol{A} \boldsymbol{x})^{*} \boldsymbol{y}+\boldsymbol{y}^{*}(\lambda \boldsymbol{A} \boldsymbol{x}) & =\boldsymbol{y}^{*}(\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{\boldsymbol{R}}) \boldsymbol{y}+\boldsymbol{y}^{*}(\omega^{-1} \boldsymbol{D}+\boldsymbol{A}_{\boldsymbol{R}}-\boldsymbol{D}) \boldsymbol{y} \\ & = \boldsymbol{y}^{*}(2 \omega^{-1}-1) \boldsymbol{D} \boldsymbol{y}=\omega^{-1}(2-\omega)|1-\lambda|^{2} \boldsymbol{x}^{*} \boldsymbol{D} \boldsymbol{x} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0330	134	0.938	`\boldsymbol{P}:=\left[\begin{array}{cc} c & s \\ -s & c \end{array}\right], \text { where } c^{2}+s^{2}=1 .`	$\boldsymbol{P}:=\left[\begin{array}{cc} c & s \\ -s & c \end{array}\right], \text { where } c^{2}+s^{2}=1 .$	$\boldsymbol{P}:=\left[\begin{array}{cc} c & s \\ -s & c \end{array}\right], \text { where } c^{2}+s^{2}=1 .$
lyche-numerical-linear-algebra_EQ0770 (12.17)	273	0.939	`\rho(\boldsymbol{A}):=\max _{\lambda \in \sigma( \boldsymbol{A})}|\lambda| .`	$\rho(\boldsymbol{A}):=\max _{\lambda \in \sigma(\boldsymbol{A})}|\lambda| .$	$\rho(\boldsymbol{A}):=\max _{\lambda \in \sigma(\boldsymbol{A})}|\lambda| .$
lyche-numerical-linear-algebra_EQ0482	190	0.940	`\max _{\boldsymbol{x} \neq 0} \frac{|\boldsymbol{A} \boldsymbol{x}|}{|\boldsymbol{x}|}=\max _{ \boldsymbol{x} \neq 0}\left|\boldsymbol{A}\left(\frac{ \boldsymbol{x}}{|\boldsymbol{x}|}\right)\right|=\max _{|\boldsymbol{y}|=1}|\boldsymbol{A} \boldsymbol{y}| .`	$\max _{\boldsymbol{x} \neq 0} \frac{\|\boldsymbol{A} \boldsymbol{x}\|}{\|\boldsymbol{x}\|}=\max _{\boldsymbol{x} \neq 0}\left\|\boldsymbol{A}\left(\frac{ \boldsymbol{x}}{\|\boldsymbol{x}\|}\right)\right\|=\max _{\|\boldsymbol{y}\|=1}\|\boldsymbol{A} \boldsymbol{y}\| .$	$\max _{\boldsymbol{x} \neq 0} \frac{\|\boldsymbol{A} \boldsymbol{x}\|}{\|\boldsymbol{x}\|}=\max _{\boldsymbol{x} \neq 0}\left\|\boldsymbol{A}\left(\frac{ \boldsymbol{x}}{\|\boldsymbol{x}\|}\right)\right\|=\max _{\|\boldsymbol{y}\|=1}\|\boldsymbol{A} \boldsymbol{y}\| .$
lyche-numerical-linear-algebra_EQ0604 (9.9)	222	0.940	`\boldsymbol{A}^{\dagger}=\boldsymbol{V}_{1} \boldsymbol{ \Sigma}_{1}^{-1} \boldsymbol{U}_{1}^{*} .`	$\boldsymbol{A}^{\dagger}=\boldsymbol{V}_{1} \boldsymbol{\Sigma}_{1}^{-1} \boldsymbol{U}_{1}^{*} .$	$\boldsymbol{A}^{\dagger}=\boldsymbol{V}_{1} \boldsymbol{\Sigma}_{1}^{-1} \boldsymbol{U}_{1}^{*} .$
lyche-numerical-linear-algebra_EQ0806 (12.35)	282	0.941	`\left|(\boldsymbol{I}-\boldsymbol{B})^{-1}\right| \leq \frac{1}{1-|\boldsymbol{B}|} .`	$\left\|(\boldsymbol{I}-\boldsymbol{B})^{-1}\right\| \leq \frac{1}{1-\|\boldsymbol{B}\|} .$	$\left\|(\boldsymbol{I}-\boldsymbol{B})^{-1}\right\| \leq \frac{1}{1-\|\boldsymbol{B}\|} .$
lyche-numerical-linear-algebra_EQ1012	342	0.942	`A_{n}=\left[\begin{array}{ccccc} 10 & 1 & 0 & \cdots & 0 \\ 1 & 10 & 1 & \ddots & \vdots \\ 0 & \ddots & \ddots & \ddots & 0 \\ \vdots & \ddots & 1 & 10 & 1 \\ 0 & \cdots & 0 & 1 & 10 \end{array}\right] \in \mathbb{R}^{n \times n} .`	$A_{n}=\left[\begin{array}{ccccc} 10 & 1 & 0 & \cdots & 0 \\ 1 & 10 & 1 & \ddots & \vdots \\ 0 & \ddots & \ddots & \ddots & 0 \\ \vdots & \ddots & 1 & 10 & 1 \\ 0 & \cdots & 0 & 1 & 10 \end{array}\right] \in \mathbb{R}^{n \times n} .$	$\boldsymbol{A}_{n}=\left[\begin{array}{ccccc} 10 & 1 & 0 & \cdots & 0 \\ 1 & 10 & 1 & \ddots & \vdots \\ 0 & \ddots & \ddots & \ddots & 0 \\ \vdots & \ddots & 1 & 10 & 1 \\ 0 & \cdots & 0 & 1 & 10 \end{array}\right] \in \mathbb{R}^{n \times n} .$

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lyche-numerical-linear-algebra_EQ0174	76	0.942	`\begin{aligned} \boldsymbol{L} \boldsymbol{U} & := \left[\begin{array}{ccc} 1 & 0 & 0 \\ l_{21}^{(1)} & 1 & 0 \\ l_{31}^{(1)} & l_{32}^{(2)} & 1 \end{array} \right]\left[\begin{array}{ccc} a_{11}^{(1)} & a_{12}^{(1)} & a_{13}^{(1)} \\ 0 & a_{22}^{(2)} & a_{23}^{(2)} \\ 0 & 0 & a_{33}^{(3)} \end{array} \right] \\ = & {\left[\begin{array}{ccc} a_{11}^{(1)} & a_{12}^{(1)} & a_{13}^{(1)} \\ l_{21}^{(1)} a_{11}^{(1)} & l_{21}^{(1)} a_{12}^{(1)}+a_{22}^{(2)} & l_{21}^{(1)} a_{13}^{(1)}+a_{23}^{(2)} \\ l_{31}^{(1)} a_{11}^{(1)} & l_{31}^{(1)} a_{12}^{(1)}+l_{32}^{(2)} a_{22}^{(2)} & l_{31}^{(1)} a_{13}^{(1)}+l_{32}^{(2)} a_{23}^{(2)}+a_{33}^{(3)} \end{array}\right]=\left[\begin{array}{lll} a_{11}^{(1)} & a_{12}^{(1)} & a_{13}^{(1)} \\ a_{21}^{(1)} & a_{22}^{(1)} & a_{23}^{(1)} \\ a_{31}^{(1)} & a_{32}^{(1)} & a_{33}^{(1)} \end{array}\right]=\boldsymbol{A} . } \end{aligned}`	$\boldsymbol{L}\boldsymbol{U} := \left[\begin{array}{ccc} 1 & 0 & 0 \\ l_{21}^{(1)} & 1 & 0 \\ l_{31}^{(1)} & l_{32}^{(2)} & 1 \end{array} \right]\left[\begin{array}{ccc} a_{11}^{(1)} & a_{12}^{(1)} & a_{13}^{(1)} \\ 0 & a_{22}^{(2)} & a_{23}^{(2)} \\ 0 & 0 & a_{33}^{(3)} \end{array} \right] \\ = \left[\begin{array}{ccc} a_{11}^{(1)} & a_{12}^{(1)} & a_{13}^{(1)} \\ l_{21}^{(1)} a_{11}^{(1)} & l_{21}^{(1)} a_{12}^{(1)}+a_{22}^{(2)} & l_{21}^{(1)} a_{13}^{(1)}+a_{23}^{(2)} \\ l_{31}^{(1)} a_{11}^{(1)} & l_{31}^{(1)} a_{12}^{(1)}+l_{32}^{(2)} a_{22}^{(2)} & l_{31}^{(1)} a_{13}^{(1)}+l_{32}^{(2)} a_{23}^{(2)}+a_{33}^{(3)} \end{array}\right]=\left[\begin{array}{lll} a_{11}^{(1)} & a_{12}^{(1)} & a_{13}^{(1)} \\ a_{21}^{(1)} & a_{22}^{(1)} & a_{23}^{(1)} \\ a_{31}^{(1)} & a_{32}^{(1)} & a_{33}^{(1)} \end{array}\right]=\boldsymbol{A}.$	$\boldsymbol{L}\boldsymbol{U} := \left[\begin{array}{ccc} 1 & 0 & 0 \\ l_{21}^{(1)} & 1 & 0 \\ l_{31}^{(1)} & l_{32}^{(2)} & 1 \end{array} \right]\left[\begin{array}{ccc} a_{11}^{(1)} & a_{12}^{(1)} & a_{13}^{(1)} \\ 0 & a_{22}^{(2)} & a_{23}^{(2)} \\ 0 & 0 & a_{33}^{(3)} \end{array} \right] \\ = \left[\begin{array}{ccc} a_{11}^{(1)} & a_{12}^{(1)} & a_{13}^{(1)} \\ l_{21}^{(1)} a_{11}^{(1)} & l_{21}^{(1)} a_{12}^{(1)}+a_{22}^{(2)} & l_{21}^{(1)} a_{13}^{(1)}+a_{23}^{(2)} \\ l_{31}^{(1)} a_{11}^{(1)} & l_{31}^{(1)} a_{12}^{(1)}+l_{32}^{(2)} a_{22}^{(2)} & l_{31}^{(1)} a_{13}^{(1)}+l_{32}^{(2)} a_{23}^{(2)}+a_{33}^{(3)} \end{array}\right]=\left[\begin{array}{lll} a_{11}^{(1)} & a_{12}^{(1)} & a_{13}^{(1)} \\ a_{21}^{(1)} & a_{22}^{(1)} & a_{23}^{(1)} \\ a_{31}^{(1)} & a_{32}^{(1)} & a_{33}^{(1)} \end{array}\right]=\boldsymbol{A}.$
lyche-numerical-linear-algebra_EQ0628	229	0.943	`\boldsymbol{C}:=\left[\begin{array}{cc} \mathbf{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \mathbf{0} \end{array}\right] \text { and } \boldsymbol{D}:= \left[\begin{array}{cc} \mathbf{0} & \boldsymbol{B} \\ \boldsymbol{B}^{*} & \mathbf{0} \end{array}\right] \in \mathbb{C}^{(m+n) \times(m+n)} .`	$\boldsymbol{C} := \left[\begin{array}{cc} \mathbf{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \mathbf{0} \end{array}\right] \text { and } \boldsymbol{D}:= \left[\begin{array}{cc} \mathbf{0} & \boldsymbol{B} \\ \boldsymbol{B}^{*} & \mathbf{0} \end{array}\right] \in \mathbb{C}^{(m+n) \times(m+n)}.$	$\boldsymbol{C} := \left[\begin{array}{cc} \mathbf{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \mathbf{0} \end{array}\right] \text { and } \boldsymbol{D}:= \left[\begin{array}{cc} \mathbf{0} & \boldsymbol{B} \\ \boldsymbol{B}^{*} & \mathbf{0} \end{array}\right] \in \mathbb{C}^{(m+n) \times(m+n)}.$
lyche-numerical-linear-algebra_EQ1054	359	0.944	`\begin{aligned} g(0) & =f(\boldsymbol{x}) \quad g(1)=f(\boldsymbol{x}+\boldsymbol{h}), \\ g^{\prime}(t) & = \sum_{i=1}^{n} h_{i} \frac{\partial f(\boldsymbol{x}+t \boldsymbol{h})}{\partial x_{i}}=\boldsymbol{h}^{T} \nabla f(\boldsymbol{x}+t \boldsymbol{h}), \\ g^{\prime \prime}(t) & =\sum_{i=1}^{n} \sum_{j=1}^{n} h_{i} h_{j} \frac{\partial^{2} f(\boldsymbol{x}+t \boldsymbol{h})}{ \partial x_{i} \partial x_{j}}=\boldsymbol{h}^{T} \nabla \nabla^{T} f(\boldsymbol{x}+t \boldsymbol{h}) \boldsymbol{h} . \end{aligned}`	$\begin{aligned} g(0) & =f(\boldsymbol{x}) \quad g(1)=f(\boldsymbol{x}+\boldsymbol{h}), \\ g^{\prime}(t) & = \sum_{i=1}^{n} h_{i} \frac{\partial f(\boldsymbol{x}+t \boldsymbol{h})}{\partial x_{i}}=\boldsymbol{h}^{T} \nabla f(\boldsymbol{x}+t \boldsymbol{h}), \\ g^{\prime \prime}(t) & =\sum_{i=1}^{n} \sum_{j=1}^{n} h_{i} h_{j} \frac{\partial^{2} f(\boldsymbol{x}+t \boldsymbol{h})}{ \partial x_{i} \partial x_{j}}=\boldsymbol{h}^{T} \nabla \nabla^{T} f(\boldsymbol{x}+t \boldsymbol{h}) \boldsymbol{h} . \end{aligned}$	$\begin{aligned} g(0) & =f(\boldsymbol{x}) \quad g(1)=f(\boldsymbol{x}+\boldsymbol{h}), \\ g^{\prime}(t) & = \sum_{i=1}^{n} h_{i} \frac{\partial f(\boldsymbol{x}+t \boldsymbol{h})}{\partial x_{i}}=\boldsymbol{h}^{T} \nabla f(\boldsymbol{x}+t \boldsymbol{h}), \\ g^{\prime \prime}(t) & =\sum_{i=1}^{n} \sum_{j=1}^{n} h_{i} h_{j} \frac{\partial^{2} f(\boldsymbol{x}+t \boldsymbol{h})}{ \partial x_{i} \partial x_{j}}=\boldsymbol{h}^{T} \nabla \nabla^{T} f(\boldsymbol{x}+t \boldsymbol{h}) \boldsymbol{h} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0373 (6.8)	152	0.945	`\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{V}=\left[ \begin{array}{c|c} \lambda_{1} & \boldsymbol{x}^{*} \\ \hline \mathbf{0} & \boldsymbol{M} \end{array}\right], \text { for some } \boldsymbol{M} \in \mathbb{C}^{k \times k} \text { and } \boldsymbol{x} \in \mathbb{C}^{k} .`	$\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{V}=\left[\begin{array}{c\|c} \lambda_{1} & \boldsymbol{x}^{*} \\ \hline \mathbf{0} & \boldsymbol{M} \end{array}\right], \text { for some } \boldsymbol{M} \in \mathbb{C}^{k \times k} \text { and } \boldsymbol{x} \in \mathbb{C}^{k}.$	$\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{V}=\left[\begin{array}{c\|c} \lambda_{1} & \boldsymbol{x}^{*} \\ \hline \mathbf{0} & \boldsymbol{M} \end{array}\right], \text { for some } \boldsymbol{M} \in \mathbb{C}^{k \times k} \text { and } \boldsymbol{x} \in \mathbb{C}^{k}.$

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lyche-numerical-linear-algebra_EQ0533	203	0.946	m^{2}\left\langle\frac{n}{m} \boldsymbol{x}, \boldsymbol{y}\right\rangle \stackrel{\text { (8.39) }}{=} m\langle n \boldsymbol{x}, \boldsymbol{y}\rangle \stackrel{\text { (8.39) }}{=} m n\langle\boldsymbol{x}, \boldsymbol{y}\rangle,	$m^{2}\left\langle\frac{n}{m} \boldsymbol{x}, \boldsymbol{y}\right\rangle \stackrel{\text { (8.39) }}{=} m\langle n \boldsymbol{x}, \boldsymbol{y}\rangle \stackrel{\text { (8.39) }}{=} m n\langle\boldsymbol{x}, \boldsymbol{y}\rangle,$	$m^{2}\left\langle\frac{n}{m} \boldsymbol{x}, \boldsymbol{y}\right\rangle \stackrel{\text { (8.39) }}{=} m\langle n \boldsymbol{x}, \boldsymbol{y}\rangle \stackrel{\text { (8.39) }}{=} m n\langle\boldsymbol{x}, \boldsymbol{y}\rangle,$
lyche-numerical-linear-algebra_EQ0686 (10.19)	246	0.946	\left(\boldsymbol{s}_{j} \otimes \boldsymbol{s}_{k} \right)^{T}\left(\boldsymbol{s}_{p} \otimes \boldsymbol{s}_{q}\right)=\frac{1}{4 h^{2}} \delta_{j, p} \delta_{k, q}, \quad j, k, p, q=1, \ldots, m,	$\left(\boldsymbol{s}_{j} \otimes \boldsymbol{s}_{k}\right)^{T}\left(\boldsymbol{s}_{p} \otimes \boldsymbol{s}_{q}\right)=\frac{1}{4 h^{2}} \delta_{j, p} \delta_{k, q}, \quad j, k, p, q=1, \ldots, m,$	$\left(\boldsymbol{s}_{j} \otimes \boldsymbol{s}_{k}\right)^{T}\left(\boldsymbol{s}_{p} \otimes \boldsymbol{s}_{q}\right)=\frac{1}{4 h^{2}} \delta_{j, p} \delta_{k, q}, \quad j, k, p, q=1, \ldots, m,$
lyche-numerical-linear-algebra_EQ0324	132	0.946	\boldsymbol{A}=\frac{1}{2}\left[\begin{array}{ccc} 1 & 1 & -1 \\ 1 & 1 & 1 \\ 1 & -1 & -1 \\ 1 & -1 & 1 \end{array}\right] \times\left[\begin{array}{lll} 2 & 2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 6 \end{array}\right]= \boldsymbol{Q}_{1} \boldsymbol{R}_{1} .	$\boldsymbol{A}=\frac{1}{2}\left[\begin{array}{ccc} 1 & 1 & -1 \\ 1 & 1 & 1 \\ 1 & -1 & -1 \\ 1 & -1 & 1 \end{array}\right] \times\left[\begin{array}{lll} 2 & 2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 6 \end{array}\right]= \boldsymbol{Q}_{1} \boldsymbol{R}_{1} .$	$\boldsymbol{A}=\frac{1}{2}\left[\begin{array}{ccc} 1 & 1 & -1 \\ 1 & 1 & 1 \\ 1 & -1 & -1 \\ 1 & -1 & 1 \end{array}\right] \times\left[\begin{array}{lll} 2 & 2 & 3 \\ 0 & 4 & 5 \\ 0 & 0 & 6 \end{array}\right]= \boldsymbol{Q}_{1} \boldsymbol{R}_{1} .$
lyche-numerical-linear-algebra_EQ0331	135	0.947	\boldsymbol{x}=\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right] \neq \mathbf{0}, \quad c:= \frac{x_{1}}{r}, \quad s:=\frac{x_{2}}{r}, \quad r:=\\| \boldsymbol{x}\\|_{2} .	$\boldsymbol{x}=\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right] \neq \mathbf{0}, \quad c:= \frac{x_{1}}{r}, \quad s:=\frac{x_{2}}{r}, \quad r:=\\| \boldsymbol{x}\\|_{2} .$	$\boldsymbol{x}=\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right] \neq \mathbf{0}, \quad c:= \frac{x_{1}}{r}, \quad s:=\frac{x_{2}}{r}, \quad r:=\\| \boldsymbol{x}\\|_{2} .$
lyche-numerical-linear-algebra_EQ1000	337	0.947	y_{0}<y_{1}<z_{1}<y_{2}<z_{2} \cdots<z_{k-1}<y_{k}<y_{k+1} .	$y_{0}<y_{1}<z_{1}<y_{2}<z_{2} \cdots<z_{k-1}<y_{k}<y_{k+1} .$	$y_{0}<y_{1}<z_{1}<y_{2}<z_{2} \cdots<z_{k-1}<y_{k}<y_{k+1} .$
lyche-numerical-linear-algebra_EQ0999	337	0.950	p_{3}(-M)<0, \quad p_{3}\left(y_{1}\right)>0, \quad p_{3} \left(y_{2}\right)<0, \quad p_{3}(+M)>0 .	$p_{3}(-M)<0, \quad p_{3}\left(y_{1}\right)>0, \quad p_{3}\left(y_{2}\right)<0, \quad p_{3}(+M)>0 .$	$p_{3}(-M)<0, \quad p_{3}\left(y_{1}\right)>0, \quad p_{3}\left(y_{2}\right)<0, \quad p_{3}(+M)>0 .$
lyche-numerical-linear-algebra_EQ0948 (13.61)	321	0.950	\begin{aligned} {\left[\boldsymbol{A} \boldsymbol{p}_{0}, \boldsymbol{A} \boldsymbol{p}_{1}, \boldsymbol{A} \boldsymbol{p}_{2}\right] } & =\left[\begin{array}{rcr} 8 & 0 & 0 \\ -4 & 3 & 0 \\ 0 & -2 & 16 / 9 \end{array}\right], \\ {\left[\boldsymbol{p}_{0}, \boldsymbol{p}_{1}, \boldsymbol{p}_{2}, \boldsymbol{p}_{3}\right] } & =\left[\begin{array}{rrrr} 4 & 1 & 4 / 9 & 0 \\ 0 & 2 & 8 / 9 & 0 \\ 0 & 0 & 12 / 9 & 0 \end{array}\right], \end{aligned}	$\begin{aligned} {\left[\boldsymbol{A} \boldsymbol{p}_{0}, \boldsymbol{A} \boldsymbol{p}_{1}, \boldsymbol{A} \boldsymbol{p}_{2}\right] } & =\left[\begin{array}{rcr} 8 & 0 & 0 \\ -4 & 3 & 0 \\ 0 & -2 & 16 / 9 \end{array}\right], \\ {\left[\boldsymbol{p}_{0}, \boldsymbol{p}_{1}, \boldsymbol{p}_{2}, \boldsymbol{p}_{3}\right] } & =\left[\begin{array}{rrrr} 4 & 1 & 4 / 9 & 0 \\ 0 & 2 & 8 / 9 & 0 \\ 0 & 0 & 12 / 9 & 0 \end{array}\right], \end{aligned}$	$\begin{aligned} {\left[\boldsymbol{A} \boldsymbol{p}_{0}, \boldsymbol{A} \boldsymbol{p}_{1}, \boldsymbol{A} \boldsymbol{p}_{2}\right] } & =\left[\begin{array}{rcr} 8 & 0 & 0 \\ -4 & 3 & 0 \\ 0 & -2 & 16 / 9 \end{array}\right], \\ {\left[\boldsymbol{p}_{0}, \boldsymbol{p}_{1}, \boldsymbol{p}_{2}, \boldsymbol{p}_{3}\right] } & =\left[\begin{array}{rrrr} 4 & 1 & 4 / 9 & 0 \\ 0 & 2 & 8 / 9 & 0 \\ 0 & 0 & 12 / 9 & 0 \end{array}\right], \end{aligned}$
lyche-numerical-linear-algebra_EQ0058	41	0.951	\left[\begin{array}{ll} a & b \\ c & d \end{array} \right]^{-1}=\alpha\left[\begin{array}{cc} d & -b \\ -c & a \end{array}\right], \quad \alpha=\frac{1}{a d-b c}	$\left[\begin{array}{ll} a & b \\ c & d \end{array} \right]^{-1}=\alpha\left[\begin{array}{cc} d & -b \\ -c & a \end{array}\right], \quad \alpha=\frac{1}{a d-b c}$	$\left[\begin{array}{ll} a & b \\ c & d \end{array} \right]^{-1}=\alpha\left[\begin{array}{cc} d & -b \\ -c & a \end{array}\right], \quad \alpha=\frac{1}{a d-b c}$
lyche-numerical-linear-algebra_EQ0220	89	0.951	\left[\begin{array}{ll} a & b \\ c & d \end{array} \right]=\left[\begin{array}{ll} 1 & 0 \\ l_{1} & 1 \end{array}\right]\left[\begin{array}{ll} u_{1} & u_{2} \\ 0 & u_{3} \end{array}\right]=\left[\begin{array}{cc} u_{1} & u_{2} \\ u_{1} l_{1} & u_{2} l_{1}+u_{3} \end{array}\right]	$\left[\begin{array}{ll} a & b \\ c & d \end{array} \right]=\left[\begin{array}{ll} 1 & 0 \\ l_{1} & 1 \end{array}\right]\left[\begin{array}{ll} u_{1} & u_{2} \\ 0 & u_{3} \end{array}\right]=\left[\begin{array}{cc} u_{1} & u_{2} \\ u_{1} l_{1} & u_{2} l_{1}+u_{3} \end{array}\right]$	$\left[\begin{array}{ll} a & b \\ c & d \end{array} \right]=\left[\begin{array}{ll} 1 & 0 \\ l_{1} & 1 \end{array}\right]\left[\begin{array}{ll} u_{1} & u_{2} \\ 0 & u_{3} \end{array}\right]=\left[\begin{array}{cc} u_{1} & u_{2} \\ u_{1} l_{1} & u_{2} l_{1}+u_{3} \end{array}\right]$

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lyche-numerical-linear-algebra_EQ0110	58	0.951	`\boldsymbol{A}_{1}=\left[\begin{array}{lll} 1 & 1 & 0 \\ 1 & 2 & 1 \\ 0 & 1 & 1 \end{array}\right], \quad \boldsymbol{A}_{2}=\left[\begin{array}{lll} 1 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 1 \end{array}\right], \quad \boldsymbol{A}_{3}=\left[\begin{array}{rrr} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{array}\right] .`	$\boldsymbol{A}_1=\left[\begin{array}{lll} 1 & 1 & 0 \\ 1 & 2 & 1 \\ 0 & 1 & 1 \end{array}\right], \quad \boldsymbol{A}_2=\left[\begin{array}{lll} 1 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 1 \end{array}\right], \quad \boldsymbol{A}_3=\left[\begin{array}{rrr} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{array}\right] .$	$\boldsymbol{A}_1=\left[\begin{array}{lll} 1 & 1 & 0 \\ 1 & 2 & 1 \\ 0 & 1 & 1 \end{array}\right], \quad \boldsymbol{A}_2=\left[\begin{array}{lll} 1 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 1 \end{array}\right], \quad \boldsymbol{A}_3=\left[\begin{array}{rrr} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0278	117	0.953	`\langle\boldsymbol{x}, \boldsymbol{y}\rangle=\langle \boldsymbol{y}, \boldsymbol{x}\rangle \quad \text { (symmetry). }`	$\langle \boldsymbol{x}, \boldsymbol{y}\rangle=\langle \boldsymbol{y}, \boldsymbol{x}\rangle \quad \text { (symmetry). }$	$\langle \boldsymbol{x}, \boldsymbol{y}\rangle=\langle \boldsymbol{y}, \boldsymbol{x}\rangle \quad \text { (symmetry). }$
lyche-numerical-linear-algebra_EQ0570	211	0.953	`\frac{\\|\hat{\boldsymbol{s}}-\boldsymbol{s}\\|_{\infty}}{ \\|\boldsymbol{s}\\|_{\infty}} \quad \text { and } \quad \frac{\\|\hat{\boldsymbol{s}}-\boldsymbol{s}\\|_{1}}{\\| \boldsymbol{s}\\|_{1}} .`	$\frac{\\|\hat{\boldsymbol{s}}-\boldsymbol{s}\\|_{\infty}}{ \\|\boldsymbol{s}\\|_{\infty}} \quad \text { and } \quad \frac{\\|\hat{\boldsymbol{s}}-\boldsymbol{s}\\|_{1}}{\\| \boldsymbol{s}\\|_{1}} .$	$\frac{\\|\hat{\boldsymbol{s}}-\boldsymbol{s}\\|_{\infty}}{ \\|\boldsymbol{s}\\|_{\infty}} \quad \text { and } \quad \frac{\\|\hat{\boldsymbol{s}}-\boldsymbol{s}\\|_{1}}{\\| \boldsymbol{s}\\|_{1}} .$
lyche-numerical-linear-algebra_EQ0620 (9.16)	227	0.953	`\sigma_{k}=\min _{\operatorname{dim}(\mathcal{S})=n-k+1} \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\\|\boldsymbol{A} \boldsymbol{x}\\|_{2}}{\\|\boldsymbol{x}\\|_{2}}=\max _{ \operatorname{dim}(\mathcal{S})=k} \min _{\substack{ \boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\\|\boldsymbol{A} \boldsymbol{x} \\|_{2}}{\\|\boldsymbol{x}\\|_{2}} .`	$\sigma_k=\min _{\operatorname{dim}(\mathcal{S})=n-k+1} \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\\|\boldsymbol{A} \boldsymbol{x}\\|_{2}}{\\|\boldsymbol{x}\\|_{2}}=\max _{ \operatorname{dim}(\mathcal{S})=k} \min _{\substack{ \boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\\|\boldsymbol{A} \boldsymbol{x} \\|_{2}}{\\|\boldsymbol{x}\\|_{2}} .$	$\sigma_k=\min _{\operatorname{dim}(\mathcal{S})=n-k+1} \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\\|\boldsymbol{A} \boldsymbol{x}\\|_{2}}{\\|\boldsymbol{x}\\|_{2}}=\max _{ \operatorname{dim}(\mathcal{S})=k} \min _{\substack{ \boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\\|\boldsymbol{A} \boldsymbol{x} \\|_{2}}{\\|\boldsymbol{x}\\|_{2}} .$
lyche-numerical-linear-algebra_EQ0722	257	0.954	`\boldsymbol{P}_{4}=\left[\begin{array}{lll} \boldsymbol{e}_{1} & \boldsymbol{e}_{3} & \boldsymbol{e}_{2} \\ \boldsymbol{e}_{4} \end{array} \right]=\left[\begin{array}{llll} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{array} \right] \quad \boldsymbol{F}_{4} \boldsymbol{P}_{4}= \left[\begin{array}{rr|rr} 1 & 1 & 1 & 1 \\ 1 & -1 & -i & i \\ \hline 1 & 1 & -1 & -1 \\ 1 & -1 & i & -i \\ \end{array}\right],`	$\boldsymbol{P}_4=\left[\begin{array}{lll} \boldsymbol{e}_1 & \boldsymbol{e}_3 & \boldsymbol{e}_2 \\ \boldsymbol{e}_4 \end{array} \right]=\left[\begin{array}{llll} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{array} \right] \quad \boldsymbol{F}_4 \boldsymbol{P}_4= \left[\begin{array}{rr\|rr} 1 & 1 & 1 & 1 \\ 1 & -1 & -i & i \\ \hline 1 & 1 & -1 & -1 \\ 1 & -1 & i & -i \\ \end{array}\right],$	$\boldsymbol{P}_4=[\boldsymbol{e}_1\ \boldsymbol{e}_3\ \boldsymbol{e}_2\ \boldsymbol{e}_4]=\left[\begin{array}{llll} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{array} \right] \quad \boldsymbol{F}_4 \boldsymbol{P}_4= \left[\begin{array}{rr\|rr} 1 & 1 & 1 & 1 \\ 1 & -1 & -i & i \\ \hline 1 & 1 & -1 & -1 \\ 1 & -1 & i & -i \\ \end{array}\right],$
lyche-numerical-linear-algebra_EQ0609 (9.12)	223	0.955	`\begin{gathered} \boldsymbol{P}_{\mathcal{R}(\boldsymbol{A})}=\boldsymbol{A} \boldsymbol{A}^{ \dagger}=\boldsymbol{U}_{1} \boldsymbol{U}_{1}^{*}= \sum_{j=1}^{r} \boldsymbol{u}_{j} \boldsymbol{u}_{j}^{*} \in \mathbb{C}^{m \times m}, \\ \boldsymbol{P}_{ \mathcal{N}\left(\boldsymbol{A}^{*}\right)}= \boldsymbol{I}-\boldsymbol{A} \boldsymbol{A}^{ \dagger}=\boldsymbol{U}_{2} \boldsymbol{U}_{2}^{*}= \sum_{j=r+1}^{m} \boldsymbol{u}_{j} \boldsymbol{u}_{j}^{*} \in \mathbb{C}^{m \times m} . \end{gathered}`	$\begin{gathered} \boldsymbol{P}_{\mathcal{R}(\boldsymbol{A})}=\boldsymbol{A} \boldsymbol{A}^{ \dagger}=\boldsymbol{U}_{1} \boldsymbol{U}_{1}^{*}= \sum_{j=1}^{r} \boldsymbol{u}_{j} \boldsymbol{u}_{j}^{*} \in \mathbb{C}^{m \times m}, \\ \boldsymbol{P}_{ \mathcal{N}\left(\boldsymbol{A}^{*}\right)}= \boldsymbol{I}-\boldsymbol{A} \boldsymbol{A}^{ \dagger}=\boldsymbol{U}_{2} \boldsymbol{U}_{2}^{*}= \sum_{j=r+1}^{m} \boldsymbol{u}_{j} \boldsymbol{u}_{j}^{*} \in \mathbb{C}^{m \times m} . \end{gathered}$	$\begin{gathered} \boldsymbol{P}_{\mathcal{R}(\boldsymbol{A})}=\boldsymbol{A} \boldsymbol{A}^{ \dagger}=\boldsymbol{U}_{1} \boldsymbol{U}_{1}^{*}= \sum_{j=1}^{r} \boldsymbol{u}_{j} \boldsymbol{u}_{j}^{*} \in \mathbb{C}^{m \times m}, \\ \boldsymbol{P}_{ \mathcal{N}\left(\boldsymbol{A}^{*}\right)}= \boldsymbol{I}-\boldsymbol{A} \boldsymbol{A}^{ \dagger}=\boldsymbol{U}_{2} \boldsymbol{U}_{2}^{*}= \sum_{j=r+1}^{m} \boldsymbol{u}_{j} \boldsymbol{u}_{j}^{*} \in \mathbb{C}^{m \times m} . \end{gathered}$
lyche-numerical-linear-algebra_EQ0753 (12.8)	270	0.958	`\boldsymbol{M} \boldsymbol{x}=(\boldsymbol{M}- \boldsymbol{A}) \boldsymbol{x}+\boldsymbol{b} .`	$\boldsymbol{M} \boldsymbol{x}=(\boldsymbol{M}- \boldsymbol{A}) \boldsymbol{x}+\boldsymbol{b} .$	$\boldsymbol{M} \boldsymbol{x}=(\boldsymbol{M}- \boldsymbol{A}) \boldsymbol{x}+\boldsymbol{b} .$

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lyche-numerical-linear-algebra_EQ0654	235	0.959	`\boldsymbol{A}=\left[\begin{array}{cc} 1 & 1 \\ 1 & 1 \\ 1 & 1+\epsilon \end{array}\right], \quad \boldsymbol{b}=\left[\begin{array}{l} 2 \\ 3 \\ 2 \end{array}\right], \quad \in \in \mathbb{R} .`	$\boldsymbol{A}=\left[\begin{array}{cc} 1 & 1 \\ 1 & 1 \\ 1 & 1+\epsilon \end{array}\right], \quad \boldsymbol{b}=\left[\begin{array}{l} 2 \\ 3 \\ 2 \end{array}\right], \quad \in \in \mathbb{R} .$	$\boldsymbol{A}=\left[\begin{array}{cc} 1 & 1 \\ 1 & 1 \\ 1 & 1+\epsilon \end{array}\right], \quad \boldsymbol{b}=\left[\begin{array}{l} 2 \\ 3 \\ 2 \end{array}\right], \quad \in \in \mathbb{R} .$
lyche-numerical-linear-algebra_EQ0443	177	0.959	`\\|\boldsymbol{A}\\|_{F} \stackrel{\text { 3. }}{=}\left\\|\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{V}\right\\|_{F}=\\|\boldsymbol{\Sigma}\\|_{F}=\sqrt{\sigma_{1}^{2}+\cdots+\sigma_{n}^{2}} .`	$\\|\boldsymbol{A}\\|_{F} \stackrel{\text { 3. }}{=}\left\\|\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{V}\right\\|_{F}=\\|\boldsymbol{\Sigma}\\|_{F}=\sqrt{\sigma_{1}^{2}+\cdots+\sigma_{n}^{2}} .$	$\\|\boldsymbol{A}\\|_{F} \stackrel{\text { 3. }}{=}\left\\|\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{V}\right\\|_{F}=\\|\boldsymbol{\Sigma}\\|_{F}=\sqrt{\sigma_{1}^{2}+\cdots+\sigma_{n}^{2}} .$
lyche-numerical-linear-algebra_EQ0469 (8.5)	186	0.960	`|x|_{\infty} \leq|x|_{p} \leq n^{1 / p}|x|_{ \infty}, \quad p \geq 1 .`	$\\|x\\|_{\infty} \leq\|x\|_{p} \leq n^{1 / p}\|x\|_{ \infty}, \quad p \geq 1 .$	$\\|x\\|_{\infty} \leq\|x\|_{p} \leq n^{1 / p}\|x\|_{ \infty}, \quad p \geq 1 .$
lyche-numerical-linear-algebra_EQ0606 (9.10)	222	0.961	`\begin{aligned} & A^{\dagger} A=V_{1} \Sigma_{1}^{-1} U_{1}^{*} U_{1} \Sigma_{1} V_{1}^{*}=V_{1} V_{1}^{*} \\ & A A^{\dagger}=U_{1} \Sigma_{1} V_{1}^{*} V_{1} \Sigma_{1}^{-1} U_{1}^{*}=U_{1} U_{1}^{*} \end{aligned}`	$\begin{aligned} & A^{\dagger} A=V_{1} \Sigma_{1}^{-1} U_{1}^{*} U_{1} \Sigma_{1} V_{1}^{*}=V_{1} V_{1}^{*} \\ & A A^{\dagger}=U_{1} \Sigma_{1} V_{1}^{*} V_{1} \Sigma_{1}^{-1} U_{1}^{*}=U_{1} U_{1}^{*} \end{aligned}$	$\begin{aligned} & \boldsymbol{A}^{\dagger} \boldsymbol{A}=\boldsymbol{V}_{1} \boldsymbol{\Sigma}_{1}^{-1} \boldsymbol{U}_{1}^{*} \boldsymbol{U}_{1} \boldsymbol{\Sigma}_{1} \boldsymbol{V}_{1}^{*}=\boldsymbol{V}_{1} \boldsymbol{V}_{1}^{*}, \\ & \boldsymbol{A} \boldsymbol{A}^{\dagger}=\boldsymbol{U}_{1} \boldsymbol{\Sigma}_{1} \boldsymbol{V}_{1}^{*} \boldsymbol{V}_{1} \boldsymbol{\Sigma}_{1}^{-1} \boldsymbol{U}_{1}^{*}=\boldsymbol{U}_{1} \boldsymbol{U}_{1}^{*}. \end{aligned}$
lyche-numerical-linear-algebra_EQ0350	141	0.962	`\boldsymbol{P}_{1,2} \boldsymbol{P}_{2,3} \cdots \boldsymbol{P}_{m-2, m-1} \boldsymbol{P}_{m-1, m} \boldsymbol{w}=\left[\begin{array}{c} \alpha \\ 0 \\ \vdots \\ 0 \end{array}\right],`	$\boldsymbol{P}_{1,2} \boldsymbol{P}_{2,3} \cdots \boldsymbol{P}_{m-2, m-1} \boldsymbol{P}_{m-1, m} \boldsymbol{w}=\left[\begin{array}{c} \alpha \\ 0 \\ \vdots \\ 0 \end{array}\right],$	$\boldsymbol{P}_{1,2} \boldsymbol{P}_{2,3} \cdots \boldsymbol{P}_{m-2, m-1} \boldsymbol{P}_{m-1, m} \boldsymbol{w}=\left[\begin{array}{c} \alpha \\ 0 \\ \vdots \\ 0 \end{array}\right],$
lyche-numerical-linear-algebra_EQ0961 (13.71)	323	0.962	`\boldsymbol{B} \boldsymbol{r}_{k}=\alpha_{k} \boldsymbol{r}_{k+1}+\beta_{k} \boldsymbol{r}_{k-1},`	$\boldsymbol{B} \boldsymbol{r}_{k}=\alpha_{k} \boldsymbol{r}_{k+1}+\beta_{k} \boldsymbol{r}_{k-1},$	$\boldsymbol{B} \boldsymbol{r}_{k}=\alpha_{k} \boldsymbol{r}_{k+1}+\beta_{k} \boldsymbol{r}_{k-1},$
lyche-numerical-linear-algebra_EQ0332	135	0.963	`\boldsymbol{P} \boldsymbol{x}=\frac{1}{r}\left[\begin{array}{rr} x_{1} & x_{2} \\ -x_{2} & x_{1} \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right]=\frac{1}{r}\left[\begin{array}{c} x_{1}^{2}+x_{2}^{2} \\ 0 \end{array}\right]=\left[\begin{array}{l} r \\ 0 \end{array}\right],`	$\boldsymbol{P} \boldsymbol{x}=\frac{1}{r}\left[\begin{array}{rr} x_{1} & x_{2} \\ -x_{2} & x_{1} \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right]=\frac{1}{r}\left[\begin{array}{c} x_{1}^{2}+x_{2}^{2} \\ 0 \end{array}\right]=\left[\begin{array}{l} r \\ 0 \end{array}\right],$	$\boldsymbol{P} \boldsymbol{x}=\frac{1}{r}\left[\begin{array}{rr} x_{1} & x_{2} \\ -x_{2} & x_{1} \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right]=\frac{1}{r}\left[\begin{array}{c} x_{1}^{2}+x_{2}^{2} \\ 0 \end{array}\right]=\left[\begin{array}{l} r \\ 0 \end{array}\right],$

Identifier	Page	Conf.	LaTeX source	Rendered	Image
lyche-numerical-linear-algebra_EQ0057	40	■ 0.969	`\begin{array}{ll} \mathbf{P}_{1}=(\boldsymbol{A}+ \boldsymbol{D})(\boldsymbol{E}+\boldsymbol{H}), & \\ \mathbf{P}_{2}=(\boldsymbol{C}+\boldsymbol{D}) \boldsymbol{E}, & \mathbf{P}_{5}=(\boldsymbol{A}+ \boldsymbol{B}) \boldsymbol{H}, \\ \mathbf{P}_{3}= \boldsymbol{A}(\boldsymbol{F}-\boldsymbol{H}), & \mathbf{P}_{6}=(\boldsymbol{C}-\boldsymbol{A})(\boldsymbol{E}+\boldsymbol{F}), \\ \mathbf{P}_{4}= \boldsymbol{D}(\boldsymbol{G}-\boldsymbol{E}), & \mathbf{P}_{7}=(\boldsymbol{B}-\boldsymbol{D})(\boldsymbol{G}+\boldsymbol{H}), \\ \boldsymbol{W}=\mathbf{P}_{1}+\mathbf{P}_{4}-\mathbf{P}_{5}+\mathbf{P}_{7}, & \boldsymbol{X}=\mathbf{P}_{3}+\mathbf{P}_{5}, \\ \boldsymbol{Y}=\mathbf{P}_{2}+\mathbf{P}_{4}, & \boldsymbol{Z}=\mathbf{P}_{1}+\mathbf{P}_{3}-\mathbf{P}_{2}+\mathbf{P}_{6} . \end{array}`	$\begin{array}{ll} \mathbf{P}_{1}=(\boldsymbol{A}+ \boldsymbol{D})(\boldsymbol{E}+\boldsymbol{H}), & \\ \mathbf{P}_{2}=(\boldsymbol{C}+\boldsymbol{D}) \boldsymbol{E}, & \mathbf{P}_{5}=(\boldsymbol{A}+ \boldsymbol{B}) \boldsymbol{H}, \\ \mathbf{P}_{3}= \boldsymbol{A}(\boldsymbol{F}-\boldsymbol{H}), & \mathbf{P}_{6}=(\boldsymbol{C}-\boldsymbol{A})(\boldsymbol{E}+\boldsymbol{F}), \\ \mathbf{P}_{4}= \boldsymbol{D}(\boldsymbol{G}-\boldsymbol{E}), & \mathbf{P}_{7}=(\boldsymbol{B}-\boldsymbol{D})(\boldsymbol{G}+\boldsymbol{H}), \\ \boldsymbol{W}=\mathbf{P}_{1}+\mathbf{P}_{4}-\mathbf{P}_{5}+\mathbf{P}_{7}, & \boldsymbol{X}=\mathbf{P}_{3}+\mathbf{P}_{5}, \\ \boldsymbol{Y}=\mathbf{P}_{2}+\mathbf{P}_{4}, & \boldsymbol{Z}=\mathbf{P}_{1}+\mathbf{P}_{3}-\mathbf{P}_{2}+\mathbf{P}_{6}. \end{array}$	$\begin{array}{ll} \mathbf{P}_{1}=(\boldsymbol{A}+ \boldsymbol{D})(\boldsymbol{E}+\boldsymbol{H}), & \\ \mathbf{P}_{2}=(\boldsymbol{C}+\boldsymbol{D}) \boldsymbol{E}, & \mathbf{P}_{5}=(\boldsymbol{A}+ \boldsymbol{B}) \boldsymbol{H}, \\ \mathbf{P}_{3}= \boldsymbol{A}(\boldsymbol{F}-\boldsymbol{H}), & \mathbf{P}_{6}=(\boldsymbol{C}-\boldsymbol{A})(\boldsymbol{E}+\boldsymbol{F}), \\ \mathbf{P}_{4}= \boldsymbol{D}(\boldsymbol{G}-\boldsymbol{E}), & \mathbf{P}_{7}=(\boldsymbol{B}-\boldsymbol{D})(\boldsymbol{G}+\boldsymbol{H}), \\ \boldsymbol{W}=\mathbf{P}_{1}+\mathbf{P}_{4}-\mathbf{P}_{5}+\mathbf{P}_{7}, & \boldsymbol{X}=\mathbf{P}_{3}+\mathbf{P}_{5}, \\ \boldsymbol{Y}=\mathbf{P}_{2}+\mathbf{P}_{4}, & \boldsymbol{Z}=\mathbf{P}_{1}+\mathbf{P}_{3}-\mathbf{P}_{2}+\mathbf{P}_{6}. \end{array}$
lyche-numerical-linear-algebra_EQ0224 (3.16)	90	■ 0.969	`\left[\begin{array}{cc} \boldsymbol{A}_{[k]} & \boldsymbol{B}_{k} \\ \boldsymbol{C}_{k} & \boldsymbol{F}_{k} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{L}_{[k]} & \mathbf{0} \\ \boldsymbol{M}_{k} & \boldsymbol{N}_{k} \end{array} \right]\left[\begin{array}{cc} \boldsymbol{U}_{[k]} & \boldsymbol{S}_{k} \\ \mathbf{0} & \boldsymbol{T}_{k} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{L}_{[k]} \boldsymbol{U}_{[k]} & \boldsymbol{L}_{[k]} \boldsymbol{S}_{k} \\ \boldsymbol{M}_{k} \boldsymbol{U}_{[k]} & \boldsymbol{M}_{k} \boldsymbol{S}_{k}+\boldsymbol{N}_{k} \boldsymbol{T}_{k} \end{array}\right],`	$\left[\begin{array}{cc} \boldsymbol{A}_{[k]} & \boldsymbol{B}_{k} \\ \boldsymbol{C}_{k} & \boldsymbol{F}_{k} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{L}_{[k]} & \mathbf{0} \\ \boldsymbol{M}_{k} & \boldsymbol{N}_{k} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{U}_{[k]} & \boldsymbol{S}_{k} \\ \mathbf{0} & \boldsymbol{T}_{k} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{L}_{[k]} \boldsymbol{U}_{[k]} & \boldsymbol{L}_{[k]} \boldsymbol{S}_{k} \\ \boldsymbol{M}_{k} \boldsymbol{U}_{[k]} & \boldsymbol{M}_{k} \boldsymbol{S}_{k}+\boldsymbol{N}_{k} \boldsymbol{T}_{k} \end{array}\right],$	$\left[\begin{array}{cc} \boldsymbol{A}_{[k]} & \boldsymbol{B}_{k} \\ \boldsymbol{C}_{k} & \boldsymbol{F}_{k} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{L}_{[k]} & \mathbf{0} \\ \boldsymbol{M}_{k} & \boldsymbol{N}_{k} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{U}_{[k]} & \boldsymbol{S}_{k} \\ \mathbf{0} & \boldsymbol{T}_{k} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{L}_{[k]} \boldsymbol{U}_{[k]} & \boldsymbol{L}_{[k]} \boldsymbol{S}_{k} \\ \boldsymbol{M}_{k} \boldsymbol{U}_{[k]} & \boldsymbol{M}_{k} \boldsymbol{S}_{k}+\boldsymbol{N}_{k} \boldsymbol{T}_{k} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0106	57	■ 0.970	`\begin{aligned} u^{\prime \prime}(x) & =\lim _{h \rightarrow 0} \frac{u^{\prime}\left(x+\frac{h}{2} \right)-u^{\prime}\left(x-\frac{h}{2}\right)}{h}= \lim _{h \rightarrow 0} \frac{\frac{u(x+h)-u(x)}{h}- \frac{u(x)-u(x-h)}{h}}{h} \\ & =\lim _{h \rightarrow 0} \frac{u(x+h)-2 u(x)+u(x-h)}{h^{2}} . \end{aligned}`	$\begin{aligned} u^{\prime \prime}(x) & =\lim _{h \rightarrow 0} \frac{u^{\prime}\left(x+\frac{h}{2} \right)-u^{\prime}\left(x-\frac{h}{2}\right)}{h}= \lim _{h \rightarrow 0} \frac{\frac{u(x+h)-u(x)}{h}- \frac{u(x)-u(x-h)}{h}}{h} \\ & =\lim _{h \rightarrow 0} \frac{u(x+h)-2 u(x)+u(x-h)}{h^{2}} . \end{aligned}$	$\begin{aligned} u^{\prime \prime}(x) & =\lim _{h \rightarrow 0} \frac{u^{\prime}\left(x+\frac{h}{2} \right)-u^{\prime}\left(x-\frac{h}{2}\right)}{h}= \lim _{h \rightarrow 0} \frac{\frac{u(x+h)-u(x)}{h}- \frac{u(x)-u(x-h)}{h}}{h} \\ & =\lim _{h \rightarrow 0} \frac{u(x+h)-2 u(x)+u(x-h)}{h^{2}} . \end{aligned}$

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lyche-numerical-linear-algebra_EQ0680	245	0.970	`\begin{aligned} (\boldsymbol{A} \otimes \boldsymbol{B}) \operatorname{vec}(\boldsymbol{V}) & =\operatorname{vec}(\boldsymbol{F}) \\ & \Leftrightarrow\left[\begin{array}{ccc} \boldsymbol{A} b_{11} & \cdots & \boldsymbol{A} b_{1 s} \\ \vdots & & \vdots \\ \boldsymbol{A} b_{s 1} & \cdots & \boldsymbol{A} b_{s s} \end{array}\right]\left[\begin{array}{c} \boldsymbol{v}_{1} \\ \vdots \\ \boldsymbol{v}_{s} \end{array}\right]=\left[\begin{array}{c} \boldsymbol{f}_{1} \\ \vdots \\ \boldsymbol{f}_{s} \end{array}\right] \\ & \Leftrightarrow \boldsymbol{A}\left[\sum_{j} b_{1 j} \boldsymbol{v}_{j}, \ldots, \sum_{j} b_{s j} \boldsymbol{v}_{j}\right]=\left[\boldsymbol{f}_{1}, \ldots, \boldsymbol{f}_{s}\right] \\ & \Leftrightarrow \boldsymbol{A}\left[\boldsymbol{V} \boldsymbol{b}_{1}, \ldots, \boldsymbol{V} \boldsymbol{b}_{s}\right]=\boldsymbol{F} \quad \Leftrightarrow \quad \boldsymbol{A} \boldsymbol{V} \boldsymbol{B}^{T}=\boldsymbol{F} . \end{aligned}`	$$\begin{aligned} (\boldsymbol{A} \otimes \boldsymbol{B}) \operatorname{vec}(\boldsymbol{V}) & =\operatorname{vec}(\boldsymbol{F}) \\ & \Leftrightarrow\left[\begin{array}{ccc} \boldsymbol{A} b_{11} & \cdots & \boldsymbol{A} b_{1 s} \\ \vdots & & \vdots \\ \boldsymbol{A} b_{s 1} & \cdots & \boldsymbol{A} b_{s s} \end{array}\right]\left[\begin{array}{c} \boldsymbol{v}_{1} \\ \vdots \\ \boldsymbol{v}_{s} \end{array}\right]=\left[\begin{array}{c} \boldsymbol{f}_{1} \\ \vdots \\ \boldsymbol{f}_{s} \end{array}\right] \\ & \Leftrightarrow \boldsymbol{A}\left[\sum_{j} b_{1 j} \boldsymbol{v}_{j}, \ldots, \sum_{j} b_{s j} \boldsymbol{v}_{j}\right]=\left[\boldsymbol{f}_{1}, \ldots, \boldsymbol{f}_{s}\right] \\ & \Leftrightarrow \boldsymbol{A}\left[\boldsymbol{V} \boldsymbol{b}_{1}, \ldots, \boldsymbol{V} \boldsymbol{b}_{s}\right]=\boldsymbol{F} \quad \Leftrightarrow \quad \boldsymbol{A} \boldsymbol{V} \boldsymbol{B}^{T}=\boldsymbol{F} . \end{aligned}$$	$$\begin{aligned} (\boldsymbol{A} \otimes \boldsymbol{B}) \operatorname{vec}(\boldsymbol{V}) & =\operatorname{vec}(\boldsymbol{F}) \\ & \Leftrightarrow\left[\begin{array}{ccc} \boldsymbol{A} b_{11} & \cdots & \boldsymbol{A} b_{1 s} \\ \vdots & & \vdots \\ \boldsymbol{A} b_{s 1} & \cdots & \boldsymbol{A} b_{s s} \end{array}\right]\left[\begin{array}{c} \boldsymbol{v}_{1} \\ \vdots \\ \boldsymbol{v}_{s} \end{array}\right]=\left[\begin{array}{c} \boldsymbol{f}_{1} \\ \vdots \\ \boldsymbol{f}_{s} \end{array}\right] \\ & \Leftrightarrow \boldsymbol{A}\left[\sum_{j} b_{1 j} \boldsymbol{v}_{j}, \ldots, \sum_{j} b_{s j} \boldsymbol{v}_{j}\right]=\left[\boldsymbol{f}_{1}, \ldots, \boldsymbol{f}_{s}\right] \\ & \Leftrightarrow \boldsymbol{A}\left[\boldsymbol{V} \boldsymbol{b}_{1}, \ldots, \boldsymbol{V} \boldsymbol{b}_{s}\right]=\boldsymbol{F} \quad \Leftrightarrow \quad \boldsymbol{A} \boldsymbol{V} \boldsymbol{B}^{T}=\boldsymbol{F} . \end{aligned}$$
lyche-numerical-linear-algebra_EQ0161	71	0.971	`a_{j}=-1-\frac{h}{2} r\left(x_{j}\right), c_{j}=-1+ \frac{h}{2} r\left(x_{j}\right), d_{j}=2+h^{2} q \left(x_{j}\right) \text {, }`	$$a_j=-1-\frac{h}{2} r\left(x_j\right), c_j=-1+\frac{h}{2} r\left(x_j\right), d_j=2+h^2 q\left(x_j\right),$$	$$a_j=-1-\frac{h}{2} r\left(x_j\right), c_j=-1+\frac{h}{2} r\left(x_j\right), d_j=2+h^2 q\left(x_j\right),$$
lyche-numerical-linear-algebra_EQ0312 (5.14)	126	0.971	`\boldsymbol{u}:=\frac{\boldsymbol{z}+\boldsymbol{e}_{1}}{ \sqrt{1+z_{1}}}, \text { where } \boldsymbol{z}:=\bar{ \rho} \boldsymbol{x} /|\boldsymbol{x}|_{2} .`	$$\boldsymbol{u}:=\frac{\boldsymbol{z}+\boldsymbol{e}_1}{\sqrt{1+z_1}}, \text { where } \boldsymbol{z}:=\bar{\rho} \boldsymbol{x} /\|\boldsymbol{x}\|_2 .$$	$$\boldsymbol{u}:=\frac{\boldsymbol{z}+\boldsymbol{e}_1}{\sqrt{1+z_1}}, \text { where } \boldsymbol{z}:=\bar{\rho} \boldsymbol{x} /\|\boldsymbol{x}\|_2 .$$
lyche-numerical-linear-algebra_EQ1043	353	0.971	`\begin{figure} \[\boldsymbol{A}=\left[\begin{array}{llll} x & x & x & x \\ 0 & x & x & x & x \\ 0 & 0 & x & x \\ 0 & 0 & 0 & x \end{array} \right] \xrightarrow{\boldsymbol{P}_{12}^{*}}\left[\begin{array}{llll} x & x & x & x \\ \mathbf{x} & x & x & x & x \\ 0 & 0 & x & x \\ 0 & 0 & 0 & x \end{array} \right] \xrightarrow{\boldsymbol{P}_{23}^{*}}\left[\begin{array}{llll} x & x & x & x \\ x & x & x & x \\ 0 & \mathbf{x} & x & x \\ 0 & 0 & 0 & x \end{array} \right] \xrightarrow{\boldsymbol{P}_{34}^{*}}\left[\begin{array}{llll} x & x & x & x \\ x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & \mathbf{x} & x \end{array} \right] . \] \captionsetup{labelformat=empty} \caption{Fig. 15.1 Post multiplication in a QR step} \end{figure}`	*(not rendered)*	$$\boldsymbol{A}=\left[\begin{array}{llll} x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \\ 0 & 0 & 0 & x \end{array}\right] \xrightarrow{\boldsymbol{P}_{12}^{*}}\left[\begin{array}{llll} x & x & x & x \\ \mathbf{x} & x & x & x \\ 0 & 0 & x & x \\ 0 & 0 & 0 & x \end{array}\right] \xrightarrow{\boldsymbol{P}_{23}^{*}}\left[\begin{array}{llll} x & x & x & x \\ x & x & x & x \\ 0 & \mathbf{x} & x & x \\ 0 & 0 & 0 & x \end{array}\right] \xrightarrow{\boldsymbol{P}_{34}^{*}}\left[\begin{array}{llll} x & x & x & x \\ x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & \mathbf{x} & x \end{array}\right] .$$

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lyche-numerical-linear-algebra_EQ0407	162	0.971	\boldsymbol{B}=\left[\begin{array}{ccccc} 0 & 0 & \cdots & 0 & -q_{0} \\ 1 & 0 & \cdots & 0 & -q_{1} \\ 0 & 1 & \cdots & 0 & -q_{2} \\ \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & \cdots & 1 & -q_{n-1} \end{array} \right] .	$\boldsymbol{B}=\left[\begin{array}{ccccc} 0 & 0 & \cdots & 0 & -q_{0} \\ 1 & 0 & \cdots & 0 & -q_{1} \\ 0 & 1 & \cdots & 0 & -q_{2} \\ \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & \cdots & 1 & -q_{n-1} \end{array} \right] .$	$\boldsymbol{B}=\left[\begin{array}{ccccc} 0 & 0 & \cdots & 0 & -q_{0} \\ 1 & 0 & \cdots & 0 & -q_{1} \\ 0 & 1 & \cdots & 0 & -q_{2} \\ \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & \cdots & 1 & -q_{n-1} \end{array} \right] .$
lyche-numerical-linear-algebra_EQ0289 (5.8)	120	0.971	\boldsymbol{v}_{1}:=\boldsymbol{s}_{1}, \quad \boldsymbol{v}_{j}:=\boldsymbol{s}_{j}-\sum_{i=1}^{j-1} \frac{\left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{i} \right\rangle}{\left\langle\boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right\rangle} \boldsymbol{v}_{i}, \quad j=2, \ldots, k .	$\boldsymbol{v}_{1}:=\boldsymbol{s}_{1}, \quad \boldsymbol{v}_{j}:=\boldsymbol{s}_{j}-\sum_{i=1}^{j-1} \frac{\left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{i} \right\rangle}{\left\langle\boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right\rangle} \boldsymbol{v}_{i}, \quad j=2, \ldots, k .$	$\boldsymbol{v}_{1}:=\boldsymbol{s}_{1}, \quad \boldsymbol{v}_{j}:=\boldsymbol{s}_{j}-\sum_{i=1}^{j-1} \frac{\left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{i} \right\rangle}{\left\langle\boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right\rangle} \boldsymbol{v}_{i}, \quad j=2, \ldots, k .$
lyche-numerical-linear-algebra_EQ0783	276	0.973	(\boldsymbol{A} \boldsymbol{x})^{*} \boldsymbol{y}+ \boldsymbol{y}^{*}(\lambda \boldsymbol{A} \boldsymbol{x})=(1-\lambda) \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}+\lambda(1-\bar{\lambda}) \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}= \left(1-|\lambda|^{2}\right) \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x},	$(\boldsymbol{A} \boldsymbol{x})^{*} \boldsymbol{y}+\boldsymbol{y}^{*}(\lambda \boldsymbol{A} \boldsymbol{x})=(1-\lambda) \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}+\lambda(1-\bar{\lambda}) \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}=\left(1-\|\lambda\|^{2}\right) \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x},$	$(\boldsymbol{A} \boldsymbol{x})^{*} \boldsymbol{y}+\boldsymbol{y}^{*}(\lambda \boldsymbol{A} \boldsymbol{x})=(1-\lambda) \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}+\lambda(1-\bar{\lambda}) \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}=\left(1-\|\lambda\|^{2}\right) \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x},$
lyche-numerical-linear-algebra_EQ0677 (10.14)	243	0.974	(\boldsymbol{A} \otimes \boldsymbol{B})(\boldsymbol{C} \otimes \boldsymbol{D})=(\boldsymbol{A} \boldsymbol{C}) \otimes(\boldsymbol{B} \boldsymbol{D}) .	$(\boldsymbol{A} \otimes \boldsymbol{B})(\boldsymbol{C} \otimes \boldsymbol{D})=(\boldsymbol{A} \boldsymbol{C}) \otimes(\boldsymbol{B} \boldsymbol{D}) .$	$(\boldsymbol{A} \otimes \boldsymbol{B})(\boldsymbol{C} \otimes \boldsymbol{D})=(\boldsymbol{A} \boldsymbol{C}) \otimes(\boldsymbol{B} \boldsymbol{D}) .$
lyche-numerical-linear-algebra_EQ0527	202	0.975	\\|\boldsymbol{x}+\boldsymbol{y}\\|^{2}+\\|\boldsymbol{x}- \boldsymbol{y}\\|^{2}=\langle\boldsymbol{x}+ \boldsymbol{y}, \boldsymbol{x}+\boldsymbol{y}\rangle+ \langle\boldsymbol{x}-\boldsymbol{y}, \boldsymbol{x}- \boldsymbol{y}\rangle=2\\|\boldsymbol{x}\\|^{2}+2\\| \boldsymbol{y}\\|^{2}	$\\|\boldsymbol{x}+\boldsymbol{y}\\|^{2}+\\|\boldsymbol{x}-\boldsymbol{y}\\|^{2}=\langle\boldsymbol{x}+\boldsymbol{y}, \boldsymbol{x}+\boldsymbol{y}\rangle+\langle\boldsymbol{x}-\boldsymbol{y}, \boldsymbol{x}-\boldsymbol{y}\rangle=2\\|\boldsymbol{x}\\|^{2}+2\\|\boldsymbol{y}\\|^{2}$	$\\|\boldsymbol{x}+\boldsymbol{y}\\|^{2}+\\|\boldsymbol{x}-\boldsymbol{y}\\|^{2}=\langle\boldsymbol{x}+\boldsymbol{y}, \boldsymbol{x}+\boldsymbol{y}\rangle+\langle\boldsymbol{x}-\boldsymbol{y}, \boldsymbol{x}-\boldsymbol{y}\rangle=2\\|\boldsymbol{x}\\|^{2}+2\\|\boldsymbol{y}\\|^{2}$
lyche-numerical-linear-algebra_EQ0994 (14.6)	336	0.975	\boldsymbol{A}=\left[\begin{array}{ccccc} d_{1} & c_{1} & & & \\ c_{1} & d_{2} & c_{2} & & \\ & \ddots & \ddots & \ddots & \\ & & c_{n-2} & d_{n-1} & c_{n-1} \\ & & & c_{n-1} & d_{n} \end{array}\right]	$\boldsymbol{A}=\left[\begin{array}{ccccc} d_{1} & c_{1} & & & \\ c_{1} & d_{2} & c_{2} & & \\ & \ddots & \ddots & \ddots & \\ & & c_{n-2} & d_{n-1} & c_{n-1} \\ & & & c_{n-1} & d_{n} \end{array}\right]$	$\boldsymbol{A}=\left[\begin{array}{ccccc} d_{1} & c_{1} & & & \\ c_{1} & d_{2} & c_{2} & & \\ & \ddots & \ddots & \ddots & \\ & & c_{n-2} & d_{n-1} & c_{n-1} \\ & & & c_{n-1} & d_{n} \end{array}\right]$
lyche-numerical-linear-algebra_EQ0081 (2.4)	47	0.975	g(x):= \begin{cases}p_{1}(x), & \text { if } x_{1} \leq x<x_{2}, \\ p_{2}(x), & \text { if } x_{2} \leq x<x_{3}, \\ \vdots & \\ p_{n-1}(x), & \text { if } x_{n-1} \leq x<x_{n}, \\ p_{n}(x), & \text { if } x_{n} \leq x \leq x_{n+1}, \end{cases}	$g(x):=\begin{cases}p_{1}(x), & \text { if } x_{1} \leq x<x_{2}, \\ p_{2}(x), & \text { if } x_{2} \leq x<x_{3}, \\ \vdots & \\ p_{n-1}(x), & \text { if } x_{n-1} \leq x<x_{n}, \\ p_{n}(x), & \text { if } x_{n} \leq x \leq x_{n+1}, \end{cases}$	$g(x):=\begin{cases}p_{1}(x), & \text { if } x_{1} \leq x<x_{2}, \\ p_{2}(x), & \text { if } x_{2} \leq x<x_{3}, \\ \vdots & \\ p_{n-1}(x), & \text { if } x_{n-1} \leq x<x_{n}, \\ p_{n}(x), & \text { if } x_{n} \leq x \leq x_{n+1}, \end{cases}$
lyche-numerical-linear-algebra_EQ0998	336	0.976	p_{3}(x)=\left(x-d_{3}\right) p_{2}(x)-c_{2}^{2} p_{1}(x)=\left(x-d_{3}\right)\left(x-y_{1}\right) \left(x-y_{2}\right)-c_{2}^{2}\left(x-d_{1}\right) .	$p_{3}(x)=\left(x-d_{3}\right) p_{2}(x)-c_{2}^{2} p_{1}(x)=\left(x-d_{3}\right)\left(x-y_{1}\right)\left(x-y_{2}\right)-c_{2}^{2}\left(x-d_{1}\right) .$	$p_{3}(x)=\left(x-d_{3}\right) p_{2}(x)-c_{2}^{2} p_{1}(x)=\left(x-d_{3}\right)\left(x-y_{1}\right)\left(x-y_{2}\right)-c_{2}^{2}\left(x-d_{1}\right) .$

Identifier	Page	Conf.	LaTeX source	Rendered	Image
lyche-numerical-linear-algebra_EQ0731	259	0.976	\begin{aligned} \boldsymbol{F}_{2 m} \boldsymbol{y} & =\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m} \boldsymbol{P}_{2 m}^{T} \boldsymbol{y}=\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m} \boldsymbol{w} \\ & = \left[\begin{array}{r|r} \boldsymbol{F}_{m} & \boldsymbol{D}_{m} \boldsymbol{F}_{m} \\ \hline \boldsymbol{F}_{m} & -\boldsymbol{D}_{m} \boldsymbol{F}_{m} \end{array}\right]\left[\begin{array}{l} \boldsymbol{w}_{1} \\ \boldsymbol{w}_{2} \end{array}\right]=\left[\begin{array}{l} \boldsymbol{q}_{1}+\boldsymbol{q}_{2} \\ \boldsymbol{q}_{1}-\boldsymbol{q}_{2} \end{array}\right], \end{aligned}	$\begin{aligned} \boldsymbol{F}_{2 m} \boldsymbol{y} & =\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m} \boldsymbol{P}_{2 m}^{T} \boldsymbol{y}=\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m} \boldsymbol{w} \\ & = \left[\begin{array}{r\|r} \boldsymbol{F}_{m} & \boldsymbol{D}_{m} \boldsymbol{F}_{m} \\ \hline \boldsymbol{F}_{m} & -\boldsymbol{D}_{m} \boldsymbol{F}_{m} \end{array}\right]\left[\begin{array}{l} \boldsymbol{w}_{1} \\ \boldsymbol{w}_{2} \end{array}\right]=\left[\begin{array}{l} \boldsymbol{q}_{1}+\boldsymbol{q}_{2} \\ \boldsymbol{q}_{1}-\boldsymbol{q}_{2} \end{array}\right], \end{aligned}$	$\begin{aligned} \boldsymbol{F}_{2 m} \boldsymbol{y} & =\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m} \boldsymbol{P}_{2 m}^{T} \boldsymbol{y}=\boldsymbol{F}_{2 m} \boldsymbol{P}_{2 m} \boldsymbol{w} \\ & = \left[\begin{array}{r\|r} \boldsymbol{F}_{m} & \boldsymbol{D}_{m} \boldsymbol{F}_{m} \\ \hline \boldsymbol{F}_{m} & -\boldsymbol{D}_{m} \boldsymbol{F}_{m} \end{array}\right]\left[\begin{array}{l} \boldsymbol{w}_{1} \\ \boldsymbol{w}_{2} \end{array}\right]=\left[\begin{array}{l} \boldsymbol{q}_{1}+\boldsymbol{q}_{2} \\ \boldsymbol{q}_{1}-\boldsymbol{q}_{2} \end{array}\right], \end{aligned}$
lyche-numerical-linear-algebra_EQ0046	37	0.976	\left[\begin{array}{ccc} c_{i_{1}, j_{1}} & \cdots & c_{i_{1}, j_{r}} \\ \vdots & & \vdots \\ c_{i_{r}, j_{1}} & \cdots & c_{i_{r}, j_{r}} \end{array}\right]=\sum_{ \boldsymbol{k}}\left[\begin{array}{ccc} a_{i_{1}, k_{1}} & \cdots & a_{i_{1}, k_{r}} \\ \vdots & & \vdots \\ a_{i_{r} k_{1}} & \cdots & a_{i_{r}, k_{r}} \end{array} \right]\left[\begin{array}{ccc} b_{k_{1}, j_{1}} & \cdots & b_{k_{1}, j_{r}} \\ \vdots & & \vdots \\ b_{k_{r}, j_{1}} & \cdots & b_{k_{r}, j_{r}} \end{array}\right],	$\left[\begin{array}{ccc} c_{i_{1}, j_{1}} & \cdots & c_{i_{1}, j_{r}} \\ \vdots & & \vdots \\ c_{i_{r}, j_{1}} & \cdots & c_{i_{r}, j_{r}} \end{array}\right]=\sum_{ \boldsymbol{k}}\left[\begin{array}{ccc} a_{i_{1}, k_{1}} & \cdots & a_{i_{1}, k_{r}} \\ \vdots & & \vdots \\ a_{i_{r} k_{1}} & \cdots & a_{i_{r}, k_{r}} \end{array} \right]\left[\begin{array}{ccc} b_{k_{1}, j_{1}} & \cdots & b_{k_{1}, j_{r}} \\ \vdots & & \vdots \\ b_{k_{r}, j_{1}} & \cdots & b_{k_{r}, j_{r}} \end{array}\right],$	$\left[\begin{array}{ccc} c_{i_{1}, j_{1}} & \cdots & c_{i_{1}, j_{r}} \\ \vdots & & \vdots \\ c_{i_{r}, j_{1}} & \cdots & c_{i_{r}, j_{r}} \end{array}\right]=\sum_{ \boldsymbol{k}}\left[\begin{array}{ccc} a_{i_{1}, k_{1}} & \cdots & a_{i_{1}, k_{r}} \\ \vdots & & \vdots \\ a_{i_{r} k_{1}} & \cdots & a_{i_{r}, k_{r}} \end{array} \right]\left[\begin{array}{ccc} b_{k_{1}, j_{1}} & \cdots & b_{k_{1}, j_{r}} \\ \vdots & & \vdots \\ b_{k_{r}, j_{1}} & \cdots & b_{k_{r}, j_{r}} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0470 (8.6)	187	0.977	\\|\boldsymbol{x}\\|_{p^{\prime}} \leq\\|\boldsymbol{x} \\|_{p} \leq n^{1 / p-1 / p^{\prime}}\\|\boldsymbol{x} \\|_{p^{\prime}}, \quad \boldsymbol{x} \in \mathbb{C}^{n}, \quad 1 \leq p \leq p^{\prime} \leq \infty .	$\\|\boldsymbol{x}\\|_{p^{\prime}} \leq\\|\boldsymbol{x} \\|_{p} \leq n^{1 / p-1 / p^{\prime}}\\|\boldsymbol{x} \\|_{p^{\prime}}, \quad \boldsymbol{x} \in \mathbb{C}^{n}, \quad 1 \leq p \leq p^{\prime} \leq \infty .$	$\\|\boldsymbol{x}\\|_{p^{\prime}} \leq\\|\boldsymbol{x} \\|_{p} \leq n^{1 / p-1 / p^{\prime}}\\|\boldsymbol{x} \\|_{p^{\prime}}, \quad \boldsymbol{x} \in \mathbb{C}^{n}, \quad 1 \leq p \leq p^{\prime} \leq \infty .$
lyche-numerical-linear-algebra_EQ0969	327	0.977	\begin{gathered} R_{i}=\left\{z \in \mathbb{C}: \left|z-a_{i i}\right| \leq r_{i}\right\}, \quad r_{i}:= \sum_{\substack{j=1 \\ j \neq i}}^{n}\left|a_{i j} \right|, \\ C_{j}=\left\{z \in \mathbb{C}:\left|z-a_{j j}\right| \leq c_{j}\right\}, \quad c_{j}:=\sum_{ \substack{i=1 \\ i \neq j}}^{n}\left|a_{i j}\right| . \end{gathered}	$\begin{gathered} R_{i}=\left\{z \in \mathbb{C}: \left\|z-a_{i i}\right\| \leq r_{i}\right\}, \quad r_{i}:= \sum_{\substack{j=1 \\ j \neq i}}^{n}\left\|a_{i j} \right\|, \\ C_{j}=\left\{z \in \mathbb{C}:\left\|z-a_{j j}\right\| \leq c_{j}\right\}, \quad c_{j}:=\sum_{ \substack{i=1 \\ i \neq j}}^{n}\left\|a_{i j}\right\| . \end{gathered}$	$\begin{gathered} R_{i}=\left\{z \in \mathbb{C}: \left\|z-a_{i i}\right\| \leq r_{i}\right\}, \quad r_{i}:= \sum_{\substack{j=1 \\ j \neq i}}^{n}\left\|a_{i j} \right\|, \\ C_{j}=\left\{z \in \mathbb{C}:\left\|z-a_{j j}\right\| \leq c_{j}\right\}, \quad c_{j}:=\sum_{ \substack{i=1 \\ i \neq j}}^{n}\left\|a_{i j}\right\| . \end{gathered}$
lyche-numerical-linear-algebra_EQ0342	137	0.977	\boldsymbol{A}=\left[\begin{array}{ll} 1 & 2 \\ 1 & 2 \\ 1 & 0 \\ 1 & 0 \end{array}\right], \quad \boldsymbol{Q}= \frac{1}{2}\left[\begin{array}{rrrr} 1 & 1 & 1 & 1 \\ 1 & 1 & -1 & -1 \\ 1 & -1 & -1 & 1 \\ 1 & -1 & 1 & -1 \end{array}\right], \quad \boldsymbol{R}=\left[\begin{array}{ll} 2 & 2 \\ 0 & 2 \\ 0 & 0 \\ 0 & 0 \end{array}\right] .	$\boldsymbol{A}=\left[\begin{array}{ll} 1 & 2 \\ 1 & 2 \\ 1 & 0 \\ 1 & 0 \end{array}\right], \quad \boldsymbol{Q}= \frac{1}{2}\left[\begin{array}{rrrr} 1 & 1 & 1 & 1 \\ 1 & 1 & -1 & -1 \\ 1 & -1 & -1 & 1 \\ 1 & -1 & 1 & -1 \end{array}\right], \quad \boldsymbol{R}=\left[\begin{array}{ll} 2 & 2 \\ 0 & 2 \\ 0 & 0 \\ 0 & 0 \end{array}\right] .$	$\boldsymbol{A}=\left[\begin{array}{ll} 1 & 2 \\ 1 & 2 \\ 1 & 0 \\ 1 & 0 \end{array}\right], \quad \boldsymbol{Q}= \frac{1}{2}\left[\begin{array}{rrrr} 1 & 1 & 1 & 1 \\ 1 & 1 & -1 & -1 \\ 1 & -1 & -1 & 1 \\ 1 & -1 & 1 & -1 \end{array}\right], \quad \boldsymbol{R}=\left[\begin{array}{ll} 2 & 2 \\ 0 & 2 \\ 0 & 0 \\ 0 & 0 \end{array}\right] .$

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lyche-numerical-linear-algebra_EQ0418 (7.2)	168	0.977	\boldsymbol{A}=\frac{1}{15}\left[\begin{array}{cc} 14 & 2 \\ 4 & 22 \\ 16 & 13 \end{array}\right]=\frac{1}{3}\left[\begin{array}{rrr} 1 & 2 & 2 \\ 2 & -2 & 1 \\ 2 & 1 & -2 \end{array}\right]\left[\begin{array}{ll} 2 & 0 \\ 0 & 1 \\ 0 & 0 \end{array}\right] \frac{1}{5}\left[\begin{array}{rr} 3 & 4 \\ 4 & -3 \end{array}\right]= \boldsymbol{U} \boldsymbol{\Sigma} \boldsymbol{V}^{*} .	$\boldsymbol{A}=\frac{1}{15}\left[\begin{array}{cc} 14 & 2 \\ 4 & 22 \\ 16 & 13 \end{array}\right]=\frac{1}{3}\left[\begin{array}{rrr} 1 & 2 & 2 \\ 2 & -2 & 1 \\ 2 & 1 & -2 \end{array}\right]\left[\begin{array}{ll} 2 & 0 \\ 0 & 1 \\ 0 & 0 \end{array}\right] \frac{1}{5}\left[\begin{array}{rr} 3 & 4 \\ 4 & -3 \end{array}\right]= \boldsymbol{U} \boldsymbol{\Sigma} \boldsymbol{V}^{*} .$	$\boldsymbol{A}=\frac{1}{15}\left[\begin{array}{cc} 14 & 2 \\ 4 & 22 \\ 16 & 13 \end{array}\right]=\frac{1}{3}\left[\begin{array}{rrr} 1 & 2 & 2 \\ 2 & -2 & 1 \\ 2 & 1 & -2 \end{array}\right]\left[\begin{array}{ll} 2 & 0 \\ 0 & 1 \\ 0 & 0 \end{array}\right] \frac{1}{5}\left[\begin{array}{rr} 3 & 4 \\ 4 & -3 \end{array}\right]= \boldsymbol{U} \boldsymbol{\Sigma} \boldsymbol{V}^{*} .$
lyche-numerical-linear-algebra_EQ0536	204	0.978	(-a)\langle\boldsymbol{x}, \boldsymbol{y}\rangle= \langle(-a) \boldsymbol{x}, \boldsymbol{y}\rangle \stackrel{(8.36)}{=} \frac{1}{4}\left(|-a \boldsymbol{x}+\boldsymbol{y}|^{2}-|-a \boldsymbol{x}- \boldsymbol{y}|^{2}\right)=-\langle a \boldsymbol{x}, \boldsymbol{y}\rangle,	$(-a)\langle \boldsymbol{x}, \boldsymbol{y}\rangle=\langle(-a) \boldsymbol{x}, \boldsymbol{y}\rangle \stackrel{(8.36)}{=} \frac{1}{4}\left(\|-a \boldsymbol{x}+\boldsymbol{y}\|^{2}-\|-a \boldsymbol{x}-\boldsymbol{y}\|^{2}\right)=-\langle a \boldsymbol{x}, \boldsymbol{y}\rangle,$	$(-a)\langle \boldsymbol{x}, \boldsymbol{y}\rangle=\langle(-a) \boldsymbol{x}, \boldsymbol{y}\rangle \stackrel{(8.36)}{=} \frac{1}{4}\left(\|-a \boldsymbol{x}+\boldsymbol{y}\|^{2}-\|-a \boldsymbol{x}-\boldsymbol{y}\|^{2}\right)=-\langle a \boldsymbol{x}, \boldsymbol{y}\rangle,$
lyche-numerical-linear-algebra_EQ0767	272	0.979	\boldsymbol{x}_{k+1}=\left[\begin{array}{l} \boldsymbol{x}_{k+1}(1) \\ \boldsymbol{x}_{k+1}(2) \end{array}\right]=\left[\begin{array}{ll} 0 & 1 / 2 \\ 0 & 1 / 4 \end{array}\right]\left[\begin{array}{l} \boldsymbol{x}_{k}(1) \\ \boldsymbol{x}_{k}(2) \end{array}\right]+\left[\begin{array}{l} 1 / 2 \\ 3 / 4 \end{array}\right]=\boldsymbol{G}_{1} \boldsymbol{x}_{k}+ \boldsymbol{c} .	$\boldsymbol{x}_{k+1}=\left[\begin{array}{l} \boldsymbol{x}_{k+1}(1) \\ \boldsymbol{x}_{k+1}(2) \end{array}\right]=\left[\begin{array}{ll} 0 & 1/2 \\ 0 & 1/4 \end{array}\right]\left[\begin{array}{l} \boldsymbol{x}_{k}(1) \\ \boldsymbol{x}_{k}(2) \end{array}\right]+\left[\begin{array}{l} 1/2 \\ 3/4 \end{array}\right]=\boldsymbol{G}_{1} \boldsymbol{x}_{k}+ \boldsymbol{c} .$	$\boldsymbol{x}_{k+1}=\left[\begin{array}{l} \boldsymbol{x}_{k+1}(1) \\ \boldsymbol{x}_{k+1}(2) \end{array}\right]=\left[\begin{array}{ll} 0 & 1/2 \\ 0 & 1/4 \end{array}\right]\left[\begin{array}{l} \boldsymbol{x}_{k}(1) \\ \boldsymbol{x}_{k}(2) \end{array}\right]+\left[\begin{array}{l} 1/2 \\ 3/4 \end{array}\right]=\boldsymbol{G}_{1} \boldsymbol{x}_{k}+ \boldsymbol{c} .$
lyche-numerical-linear-algebra_EQ0125	61	0.979	\begin{aligned} \boldsymbol{s}_{j}^{T} \boldsymbol{s}_{j} & =\sum_{k=1}^{m} \sin ^{2}(k j \pi h)=\sum_{k=0}^{m} \sin ^{2}(k j \pi h)=\frac{1}{2} \sum_{k=0}^{m}(1- \cos (2 k j \pi h)) \\ & =\frac{m+1}{2}-\frac{1}{2} \sum_{k=0}^{m} \cos (2 k j \pi h)=\frac{m+1}{2}, \end{aligned}	$\begin{aligned} \boldsymbol{s}_{j}^{T} \boldsymbol{s}_{j} & =\sum_{k=1}^{m} \sin ^{2}(k j \pi h)=\sum_{k=0}^{m} \sin ^{2}(k j \pi h)=\frac{1}{2} \sum_{k=0}^{m}(1- \cos (2 k j \pi h)) \\ & =\frac{m+1}{2}-\frac{1}{2} \sum_{k=0}^{m} \cos (2 k j \pi h)=\frac{m+1}{2}, \end{aligned}$	$\begin{aligned} \boldsymbol{s}_{j}^{T} \boldsymbol{s}_{j} & =\sum_{k=1}^{m} \sin ^{2}(k j \pi h)=\sum_{k=0}^{m} \sin ^{2}(k j \pi h)=\frac{1}{2} \sum_{k=0}^{m}(1- \cos (2 k j \pi h)) \\ & =\frac{m+1}{2}-\frac{1}{2} \sum_{k=0}^{m} \cos (2 k j \pi h)=\frac{m+1}{2}, \end{aligned}$
lyche-numerical-linear-algebra_EQ0172	76	0.980	\begin{aligned} a_{11}^{(1)} x_{1}+a_{12}^{(1)} x_{2}+a_{13}^{(1)} x_{3}=b_{1}^{(1)}, & \mathrm{I} \\ a_{22}^{(2)} x_{2}+a_{23}^{(2)} x_{3}=b_{2}^{(2)}, & \mathrm{II}^{\prime} \\ a_{33}^{(3)} x_{3}=b_{3}^{(3)}, & \mathrm{III}^{\prime \prime}, \end{aligned}	$\begin{aligned} a_{11}^{(1)} x_{1}+a_{12}^{(1)} x_{2}+a_{13}^{(1)} x_{3}=b_{1}^{(1)}, & \mathrm{I} \\ a_{22}^{(2)} x_{2}+a_{23}^{(2)} x_{3}=b_{2}^{(2)}, & \mathrm{II}^{\prime} \\ a_{33}^{(3)} x_{3}=b_{3}^{(3)}, & \mathrm{III}^{\prime \prime}, \end{aligned}$	$\begin{aligned} a_{11}^{(1)} x_{1}+a_{12}^{(1)} x_{2}+a_{13}^{(1)} x_{3}=b_{1}^{(1)}, & \mathrm{I} \\ a_{22}^{(2)} x_{2}+a_{23}^{(2)} x_{3}=b_{2}^{(2)}, & \mathrm{II}^{\prime} \\ a_{33}^{(3)} x_{3}=b_{3}^{(3)}, & \mathrm{III}^{\prime \prime}, \end{aligned}$
lyche-numerical-linear-algebra_EQ0703	253	0.981	\begin{aligned} \boldsymbol{T s}_{j} & =\lambda_{j} \boldsymbol{s}_{j}, \quad j=1, \ldots, m, \\ \boldsymbol{s}_{j} & =[\sin (j \pi h), \sin (2 j \pi h), \ldots, \sin (m j \pi h)]^{T}, \\ \lambda_{j} & =2-2 \cos (j \pi h)=4 \sin ^{2}(j \pi h / 2), \quad h=1 /(m+1), \\ \boldsymbol{s}_{j}^{T} \boldsymbol{s}_{k} & =\delta_{j, k} /(2 h) \text { for all } j, k . \end{aligned}	$\begin{aligned} \boldsymbol{T s}_{j} & =\lambda_{j} \boldsymbol{s}_{j}, \quad j=1, \ldots, m, \\ \boldsymbol{s}_{j} & =[\sin (j \pi h), \sin (2 j \pi h), \ldots, \sin (m j \pi h)]^{T}, \\ \lambda_{j} & =2-2 \cos (j \pi h)=4 \sin ^{2}(j \pi h / 2), \quad h=1 /(m+1), \\ \boldsymbol{s}_{j}^{T} \boldsymbol{s}_{k} & =\delta_{j, k} /(2 h) \text { for all } j, k . \end{aligned}$	$\begin{aligned} \boldsymbol{T s}_{j} & =\lambda_{j} \boldsymbol{s}_{j}, \quad j=1, \ldots, m, \\ \boldsymbol{s}_{j} & =[\sin (j \pi h), \sin (2 j \pi h), \ldots, \sin (m j \pi h)]^{T}, \\ \lambda_{j} & =2-2 \cos (j \pi h)=4 \sin ^{2}(j \pi h / 2), \quad h=1 /(m+1), \\ \boldsymbol{s}_{j}^{T} \boldsymbol{s}_{k} & =\delta_{j, k} /(2 h) \text { for all } j, k . \end{aligned}$

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lyche-numerical-linear-algebra_EQ0674	243	0.981	`\boldsymbol{T}_{1} \otimes \boldsymbol{I}+\boldsymbol{I} \otimes \boldsymbol{T}_{1}=\left[\begin{array}{ccc} \boldsymbol{T}_{1} & \mathbf{0} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{T}_{1} & \mathbf{0} \\ \mathbf{0} & \mathbf{0} & \boldsymbol{T}_{1} \end{array} \right]+\left[\begin{array}{ccc} d \boldsymbol{I} & a \boldsymbol{I} & \mathbf{0} \\ a \boldsymbol{I} & d \boldsymbol{I} & a \boldsymbol{I} \\ \mathbf{0} & a \boldsymbol{I} & d \boldsymbol{I} \end{array}\right]= \boldsymbol{T}_{2}`	$\boldsymbol{T}_1 \otimes \boldsymbol{I}+\boldsymbol{I} \otimes \boldsymbol{T}_1=\left[\begin{array}{ccc} \boldsymbol{T}_1 & \mathbf{0} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{T}_1 & \mathbf{0} \\ \mathbf{0} & \mathbf{0} & \boldsymbol{T}_1 \end{array}\right]+\left[\begin{array}{ccc} d \boldsymbol{I} & a \boldsymbol{I} & \mathbf{0} \\ a \boldsymbol{I} & d \boldsymbol{I} & a \boldsymbol{I} \\ \mathbf{0} & a \boldsymbol{I} & d \boldsymbol{I} \end{array}\right]=\boldsymbol{T}_2$	$\boldsymbol{T}_1 \otimes \boldsymbol{I}+\boldsymbol{I} \otimes \boldsymbol{T}_1=\left[\begin{array}{ccc} \boldsymbol{T}_1 & \mathbf{0} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{T}_1 & \mathbf{0} \\ \mathbf{0} & \mathbf{0} & \boldsymbol{T}_1 \end{array}\right]+\left[\begin{array}{ccc} d \boldsymbol{I} & a \boldsymbol{I} & \mathbf{0} \\ a \boldsymbol{I} & d \boldsymbol{I} & a \boldsymbol{I} \\ \mathbf{0} & a \boldsymbol{I} & d \boldsymbol{I} \end{array}\right]=\boldsymbol{T}_2$
lyche-numerical-linear-algebra_EQ0613 (9.13)	225	0.981	`\frac{1}{K(\boldsymbol{A})} \frac{\left| \boldsymbol{e}_{1}\right|}{\left|\boldsymbol{b}_{1} \right|} \leq \frac{|\boldsymbol{y}-\boldsymbol{x}|}{ |\boldsymbol{x}|} \leq K(\boldsymbol{A}) \frac{\left |\boldsymbol{e}_{1}\right|}{\left|\boldsymbol{b}_{1} \right|}, \quad K(\boldsymbol{A})=|\boldsymbol{A}| \left|\boldsymbol{A}^{\dagger}\right| .`	$\frac{1}{K(\boldsymbol{A})} \frac{\left\| \boldsymbol{e}_1\right\|}{\left\|\boldsymbol{b}_1 \right\|} \leq \frac{\|\boldsymbol{y}-\boldsymbol{x}\|}{ \|\boldsymbol{x}\|} \leq K(\boldsymbol{A}) \frac{\left \|\boldsymbol{e}_1\right\|}{\left\|\boldsymbol{b}_1 \right\|}, \quad K(\boldsymbol{A})=\|\boldsymbol{A}\| \left\|\boldsymbol{A}^{\dagger}\right\| .$	$\frac{1}{K(\boldsymbol{A})} \frac{\left\| \boldsymbol{e}_1\right\|}{\left\|\boldsymbol{b}_1 \right\|} \leq \frac{\|\boldsymbol{y}-\boldsymbol{x}\|}{ \|\boldsymbol{x}\|} \leq K(\boldsymbol{A}) \frac{\left \|\boldsymbol{e}_1\right\|}{\left\|\boldsymbol{b}_1 \right\|}, \quad K(\boldsymbol{A})=\|\boldsymbol{A}\| \left\|\boldsymbol{A}^{\dagger}\right\| .$
lyche-numerical-linear-algebra_EQ0127	62	0.981	`\lambda \boldsymbol{y}^{*} \boldsymbol{x}= \boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{x}=\left(\boldsymbol{x}^{*} \boldsymbol{A}^{*} \boldsymbol{y} \right)^{*}=\left(\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{y}\right)^{*}=\left(\mu \boldsymbol{x}^{*} \boldsymbol{y}\right)^{*}=\mu \boldsymbol{y}^{*} \boldsymbol{x},`	$\lambda \boldsymbol{y}^{*} \boldsymbol{x}= \boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{x}=\left(\boldsymbol{x}^{*} \boldsymbol{A}^{*} \boldsymbol{y} \right)^{*}=\left(\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{y}\right)^{*}=\left(\mu \boldsymbol{x}^{*} \boldsymbol{y}\right)^{*}=\mu \boldsymbol{y}^{*} \boldsymbol{x},$	$\lambda \boldsymbol{y}^{*} \boldsymbol{x}= \boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{x}=\left(\boldsymbol{x}^{*} \boldsymbol{A}^{*} \boldsymbol{y} \right)^{*}=\left(\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{y}\right)^{*}=\left(\mu \boldsymbol{x}^{*} \boldsymbol{y}\right)^{*}=\mu \boldsymbol{y}^{*} \boldsymbol{x},$
lyche-numerical-linear-algebra_EQ1020 (15.3)	345	0.981	`\boldsymbol{z}_{k}=c_{1} \lambda_{1}^{k} \boldsymbol{v}_{1}+c_{2} \lambda_{2}^{k} \boldsymbol{v}_{2}+\cdots+c_{n} \lambda_{n}^{k} \boldsymbol{v}_{n}, \quad k=0,1,2, \ldots .`	$\boldsymbol{z}_k=c_1 \lambda_1^k \boldsymbol{v}_1+c_2 \lambda_2^k \boldsymbol{v}_2+\cdots+c_n \lambda_n^k \boldsymbol{v}_n, \quad k=0,1,2, \ldots .$	$\boldsymbol{z}_k=c_1 \lambda_1^k \boldsymbol{v}_1+c_2 \lambda_2^k \boldsymbol{v}_2+\cdots+c_n \lambda_n^k \boldsymbol{v}_n, \quad k=0,1,2, \ldots .$
lyche-numerical-linear-algebra_EQ1021 (15.4)	345	0.982	`\frac{z_{k}}{\lambda_{1}^{k}}=c_{1} \boldsymbol{v}_{1}+c_{2}\left(\frac{\lambda_{2}}{ \lambda_{1}}\right)^{k} \boldsymbol{v}_{2}+\cdots+c_{n} \left(\frac{\lambda_{n}}{\lambda_{1}}\right)^{k} \boldsymbol{v}_{n}, \quad k=0,1,2, \ldots`	$\frac{z_k}{\lambda_1^k}=c_1 \boldsymbol{v}_1+c_2\left(\frac{\lambda_2}{\lambda_1}\right)^k \boldsymbol{v}_2+\cdots+c_n\left(\frac{\lambda_n}{\lambda_1}\right)^k \boldsymbol{v}_n, \quad k=0,1,2, \ldots$	$\frac{z_k}{\lambda_1^k}=c_1 \boldsymbol{v}_1+c_2\left(\frac{\lambda_2}{\lambda_1}\right)^k \boldsymbol{v}_2+\cdots+c_n\left(\frac{\lambda_n}{\lambda_1}\right)^k \boldsymbol{v}_n, \quad k=0,1,2, \ldots .$
lyche-numerical-linear-algebra_EQ0497	194	0.982	`\left|x_{i}\right| \leq\left|y_{i}\right|, i=1, \ldots, n \Longrightarrow|\boldsymbol{x}| \leq|\boldsymbol{y}| \text {, for all } \boldsymbol{x}, \boldsymbol{y} \in \mathbb{C}^{n} .`	$\left\|x_i\right\| \leq\left\|y_i\right\|, i=1, \ldots, n \Longrightarrow\|\boldsymbol{x}\| \leq\|\boldsymbol{y}\|, \text{ for all } \boldsymbol{x}, \boldsymbol{y} \in \mathbb{C}^n .$	$\left\|x_i\right\| \leq\left\|y_i\right\|, i=1, \ldots, n \Longrightarrow\|\boldsymbol{x}\| \leq\|\boldsymbol{y}\|, \text{ for all } \boldsymbol{x}, \boldsymbol{y} \in \mathbb{C}^n .$
lyche-numerical-linear-algebra_EQ0537	204	0.983	`|\boldsymbol{x}|_{\boldsymbol{A}} \leq|\boldsymbol{y}|_{\boldsymbol{A}} \Longrightarrow|\boldsymbol{x}|_{2} \leq \sqrt{\frac{\lambda_{1}}{\lambda_{n}}}|\boldsymbol{y}|_{2},`	$\|\boldsymbol{x}\|_{\boldsymbol{A}} \leq\|\boldsymbol{y}\|_{\boldsymbol{A}} \Longrightarrow\|\boldsymbol{x}\|_2 \leq \sqrt{\frac{\lambda_1}{\lambda_n}}\|\boldsymbol{y}\|_2,$	$\|\boldsymbol{x}\|_{\boldsymbol{A}} \leq\|\boldsymbol{y}\|_{\boldsymbol{A}} \Longrightarrow\|\boldsymbol{x}\|_2 \leq \sqrt{\frac{\lambda_1}{\lambda_n}}\|\boldsymbol{y}\|_2,$
lyche-numerical-linear-algebra_EQ0573	212	0.984	`|\boldsymbol{x}|_{p} \leq|\boldsymbol{x}|_{q} \leq n^{1 / q-1 / p}|\boldsymbol{x}|_{p}, \quad \boldsymbol{x} \in \mathbb{C}^{n} .`	$\|\boldsymbol{x}\|_p \leq\|\boldsymbol{x}\|_q \leq n^{1/q-1/p}\|\boldsymbol{x}\|_p, \quad \boldsymbol{x} \in \mathbb{C}^n .$	$\|\boldsymbol{x}\|_p \leq\|\boldsymbol{x}\|_q \leq n^{1/q-1/p}\|\boldsymbol{x}\|_p, \quad \boldsymbol{x} \in \mathbb{C}^n .$

Identifier	Page	Conf.	LaTeX source	Rendered	Image
lyche-numerical-linear-algebra_EQ0184 (3.4)	79	■ 0.984	\boldsymbol{L}=\left[\begin{array}{cccc} 1 & & & \\ l_{21}^{(1)} & 1 & & \\ \vdots & & \ddots & \\ l_{n 1}^{(1)} & l_{n 2}^{(2)} & \cdots & 1 \end{array} \right], \quad \boldsymbol{U}=\left[\begin{array}{ccc} a_{11}^{(1)} & \cdots & a_{1 n}^{(1)} \\ & \ddots & \vdots \\ & & a_{nn}^{(n)} \end{array}\right],	$\boldsymbol{L}=\left[\begin{array}{cccc} 1 & & & \\ l_{21}^{(1)} & 1 & & \\ \vdots & & \ddots & \\ l_{n1}^{(1)} & l_{n2}^{(2)} & \cdots & 1 \end{array} \right], \quad \boldsymbol{U}=\left[\begin{array}{ccc} a_{11}^{(1)} & \cdots & a_{1n}^{(1)} \\ & \ddots & \vdots \\ & & a_{nn}^{(n)} \end{array}\right],$	$\boldsymbol{L}=\left[\begin{array}{cccc} 1 & & & \\ l_{21}^{(1)} & 1 & & \\ \vdots & & \ddots & \\ l_{n1}^{(1)} & l_{n2}^{(2)} & \cdots & 1 \end{array} \right], \quad \boldsymbol{U}=\left[\begin{array}{ccc} a_{11}^{(1)} & \cdots & a_{1n}^{(1)} \\ & \ddots & \vdots \\ & & a_{nn}^{(n)} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0019 (1.7)	29	■ 0.984	\operatorname{dim}(\mathcal{S}+\mathcal{T})= \operatorname{dim}(\mathcal{S})+\operatorname{dim}(\mathcal{T})-\operatorname{dim}(\mathcal{S} \cap \mathcal{T}) .	$\operatorname{dim}(\mathcal{S}+\mathcal{T})=\operatorname{dim}(\mathcal{S})+\operatorname{dim}(\mathcal{T})-\operatorname{dim}(\mathcal{S} \cap \mathcal{T}).$	$\operatorname{dim}(\mathcal{S}+\mathcal{T})=\operatorname{dim}(\mathcal{S})+\operatorname{dim}(\mathcal{T})-\operatorname{dim}(\mathcal{S} \cap \mathcal{T}).$
lyche-numerical-linear-algebra_EQ0502 (8.23)	196	■ 0.984	\frac{1}{K(\boldsymbol{A})} \frac{|\boldsymbol{r}(\boldsymbol{y})|}{|\boldsymbol{b}|} \leq \frac{\\| \boldsymbol{y}-\boldsymbol{x}|}{|\boldsymbol{x}|} \leq K(\boldsymbol{A}) \frac{|\boldsymbol{r}(\boldsymbol{y})|}{|\boldsymbol{b}|} .	$\frac{1}{K(\boldsymbol{A})} \frac{\|\boldsymbol{r}(\boldsymbol{y})\|}{\|\boldsymbol{b}\|} \leq \frac{\|\boldsymbol{y}-\boldsymbol{x}\|}{\|\boldsymbol{x}\|} \leq K(\boldsymbol{A}) \frac{\|\boldsymbol{r}(\boldsymbol{y})\|}{\|\boldsymbol{b}\|}.$	$\frac{1}{K(\boldsymbol{A})} \frac{\|\boldsymbol{r}(\boldsymbol{y})\|}{\|\boldsymbol{b}\|} \leq \frac{\|\boldsymbol{y}-\boldsymbol{x}\|}{\|\boldsymbol{x}\|} \leq K(\boldsymbol{A}) \frac{\|\boldsymbol{r}(\boldsymbol{y})\|}{\|\boldsymbol{b}\|}.$
lyche-numerical-linear-algebra_EQ0740	262	■ 0.984	x_{j, k}=\frac{h^{4} g_{j, k}}{\sigma_{j}+\sigma_{k}- \frac{2}{3} \sigma_{j} \sigma_{k}}, \text { where } \sigma_{j}=\sin ^{2}((j \pi h) / 2) \text { for } j, k=1,2, \ldots, m .	$x_{j,k}=\frac{h^4 g_{j,k}}{\sigma_j+\sigma_k-\frac{2}{3}\sigma_j\sigma_k}, \text{ where } \sigma_j=\sin^2((j\pi h)/2) \text{ for } j,k=1,2,\ldots,m.$	$x_{j,k}=\frac{h^4 g_{j,k}}{\sigma_j+\sigma_k-\frac{2}{3}\sigma_j\sigma_k}, \text{ where } \sigma_j=\sin^2\left((j\pi h)/2\right) \text{ for } j,k=1,2,\ldots,m.$
lyche-numerical-linear-algebra_EQ0114	59	■ 0.985	u^{\prime \prime}(j h) \approx \frac{u((j+1) h)-2 u(j h)+u((j-1) h)}{h^{2}}, \quad j=1, \ldots, m,	$u''(jh)\approx\frac{u((j+1)h)-2u(jh)+u((j-1)h)}{h^2}, \quad j=1,\ldots,m,$	$u''(jh)\approx\frac{u((j+1)h)-2u(jh)+u((j-1)h)}{h^2}, \quad j=1,\ldots,m,$
lyche-numerical-linear-algebra_EQ0564	210	■ 0.985	A:=\left[\begin{array}{cccccc} 2 & \mu_{1} & 0 & \cdots & 0 & \lambda_{1} \\ \lambda_{2} & 2 & \mu_{2} & \ddots & & 0 \\ 0 & \ddots & \ddots & \ddots & \ddots & \vdots \\ \vdots & \ddots & \ddots & \ddots & \ddots & 0 \\ 0 & & \ddots & \lambda_{n-1} & 2 & \mu_{n-1} \\ \mu_{n} & 0 & \cdots & 0 & \lambda_{n} & 2 \end{array}\right],	$A:=\left[\begin{array}{cccccc} 2 & \mu_1 & 0 & \cdots & 0 & \lambda_1 \\ \lambda_2 & 2 & \mu_2 & \ddots & & 0 \\ 0 & \ddots & \ddots & \ddots & \ddots & \vdots \\ \vdots & \ddots & \ddots & \ddots & \ddots & 0 \\ 0 & & \ddots & \lambda_{n-1} & 2 & \mu_{n-1} \\ \mu_n & 0 & \cdots & 0 & \lambda_n & 2 \end{array}\right],$	$\boldsymbol{A}:=\left[\begin{array}{cccccc} 2 & \mu_1 & 0 & \cdots & 0 & \lambda_1 \\ \lambda_2 & 2 & \mu_2 & \ddots & & 0 \\ 0 & \ddots & \ddots & \ddots & \ddots & \vdots \\ \vdots & \ddots & \ddots & \ddots & \ddots & 0 \\ 0 & & \ddots & \lambda_{n-1} & 2 & \mu_{n-1} \\ \mu_n & 0 & \cdots & 0 & \lambda_n & 2 \end{array}\right],$
lyche-numerical-linear-algebra_EQ0701 (11.3)	252	■ 0.985	\begin{aligned} \boldsymbol{y}_{1} & =\boldsymbol{b}_{1}, \quad \boldsymbol{y}_{k}=\boldsymbol{b}_{k}- \boldsymbol{L}_{k-1} \boldsymbol{y}_{k-1}, \quad k=2,3, \ldots, m, \\ \boldsymbol{x}_{m} & =\boldsymbol{U}_{m}^{-1} \boldsymbol{y}_{m}, \quad \boldsymbol{x}_{k}=\boldsymbol{U}_{k}^{-1}\left(\boldsymbol{y}_{k}-\boldsymbol{C}_{k} \boldsymbol{x}_{k+1}\right), \quad k=m-1, \ldots, 2,1 . \end{aligned}	$\begin{aligned} \boldsymbol{y}_1 &= \boldsymbol{b}_1, \quad \boldsymbol{y}_k=\boldsymbol{b}_k-\boldsymbol{L}_{k-1}\boldsymbol{y}_{k-1}, \quad k=2,3,\ldots,m, \\ \boldsymbol{x}_m &= \boldsymbol{U}_m^{-1}\boldsymbol{y}_m, \quad \boldsymbol{x}_k=\boldsymbol{U}_k^{-1}\left(\boldsymbol{y}_k-\boldsymbol{C}_k\boldsymbol{x}_{k+1}\right), \quad k=m-1,\ldots,2,1. \end{aligned}$	$\begin{aligned} \boldsymbol{y}_1 &= \boldsymbol{b}_1, \quad \boldsymbol{y}_k=\boldsymbol{b}_k-\boldsymbol{L}_{k-1}\boldsymbol{y}_{k-1}, \quad k=2,3,\ldots,m, \\ \boldsymbol{x}_m &= \boldsymbol{U}_m^{-1}\boldsymbol{y}_m, \quad \boldsymbol{x}_k=\boldsymbol{U}_k^{-1}(\boldsymbol{y}_k-\boldsymbol{C}_k\boldsymbol{x}_{k+1}), \quad k=m-1,\ldots,2,1. \end{aligned}$

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lyche-numerical-linear-algebra_EQ0848 (13.12)	294	0.985	`\begin{aligned} \boldsymbol{p}_{j} & := \boldsymbol{r}_{j}-\sum_{i=0}^{j-1}\left(\frac{\boldsymbol{r}_{j}^{T} \boldsymbol{A} \boldsymbol{p}_{i}}{\boldsymbol{p}_{i}^{T} \boldsymbol{A} \boldsymbol{p}_{i}}\right) \boldsymbol{p}_{i}, \\ \boldsymbol{x}_{j+1} & := \boldsymbol{x}_{j}+\alpha_{j} \boldsymbol{p}_{j} \quad \alpha_{j}:=\frac{\boldsymbol{r}_{j}^{T} \boldsymbol{r}_{j}}{\boldsymbol{p}_{j}^{T} \boldsymbol{A} \boldsymbol{p}_{j}}, \\ \boldsymbol{r}_{j+1} & = \boldsymbol{r}_{j}-\alpha_{j} \boldsymbol{A} \boldsymbol{p}_{j} . \end{aligned}`	$$\begin{aligned} \boldsymbol{p}_{j} & := \boldsymbol{r}_{j}-\sum_{i=0}^{j-1}\left(\frac{\boldsymbol{r}_{j}^{T} \boldsymbol{A} \boldsymbol{p}_{i}}{\boldsymbol{p}_{i}^{T} \boldsymbol{A} \boldsymbol{p}_{i}}\right) \boldsymbol{p}_{i}, \\ \boldsymbol{x}_{j+1} & := \boldsymbol{x}_{j}+\alpha_{j} \boldsymbol{p}_{j} \quad \alpha_{j}:=\frac{\boldsymbol{r}_{j}^{T} \boldsymbol{r}_{j}}{\boldsymbol{p}_{j}^{T} \boldsymbol{A} \boldsymbol{p}_{j}}, \\ \boldsymbol{r}_{j+1} & = \boldsymbol{r}_{j}-\alpha_{j} \boldsymbol{A} \boldsymbol{p}_{j} . \end{aligned}$$	$$\begin{aligned} \boldsymbol{p}_{j} & := \boldsymbol{r}_{j}-\sum_{i=0}^{j-1}\left(\frac{\boldsymbol{r}_{j}^{T} \boldsymbol{A} \boldsymbol{p}_{i}}{\boldsymbol{p}_{i}^{T} \boldsymbol{A} \boldsymbol{p}_{i}}\right) \boldsymbol{p}_{i}, \\ \boldsymbol{x}_{j+1} & := \boldsymbol{x}_{j}+\alpha_{j} \boldsymbol{p}_{j} \quad \alpha_{j}:=\frac{\boldsymbol{r}_{j}^{T} \boldsymbol{r}_{j}}{\boldsymbol{p}_{j}^{T} \boldsymbol{A} \boldsymbol{p}_{j}}, \\ \boldsymbol{r}_{j+1} & = \boldsymbol{r}_{j}-\alpha_{j} \boldsymbol{A} \boldsymbol{p}_{j} . \end{aligned}$$
lyche-numerical-linear-algebra_EQ0210	87	0.985	`\begin{array}{r} 10^{-4} x_{1}+2 x_{2}=4 \\ x_{1}+x_{2}=3 \end{array}`	$$\begin{array}{r} 10^{-4} x_{1}+2 x_{2}=4 \\ x_{1}+x_{2}=3 \end{array}$$	$$\begin{array}{r} 10^{-4} x_{1}+2 x_{2}=4 \\ x_{1}+x_{2}=3 \end{array}$$
lyche-numerical-linear-algebra_EQ0429	172	0.985	`\boldsymbol{A}=\left[\begin{array}{ll} 1 & 1 \\ 1 & 1 \\ 0 & 0 \end{array}\right] .`	$$\boldsymbol{A}=\left[\begin{array}{ll} 1 & 1 \\ 1 & 1 \\ 0 & 0 \end{array}\right] .$$	$$\boldsymbol{A}=\left[\begin{array}{ll} 1 & 1 \\ 1 & 1 \\ 0 & 0 \end{array}\right] .$$
lyche-numerical-linear-algebra_EQ0145	65	0.985	`\boldsymbol{B}_{11} \boldsymbol{A}_{11}=\boldsymbol{I}, \boldsymbol{B}_{21} \boldsymbol{A}_{11}=\mathbf{0}, \boldsymbol{B}_{21} \boldsymbol{A}_{12}+ \boldsymbol{B}_{22} \boldsymbol{A}_{22}= \boldsymbol{I}, \boldsymbol{B}_{11} \boldsymbol{A}_{12}+ \boldsymbol{B}_{12} \boldsymbol{A}_{22}=\mathbf{0} .`	$$\boldsymbol{B}_{11} \boldsymbol{A}_{11}=\boldsymbol{I}, \boldsymbol{B}_{21} \boldsymbol{A}_{11}=\mathbf{0}, \boldsymbol{B}_{21} \boldsymbol{A}_{12}+ \boldsymbol{B}_{22} \boldsymbol{A}_{22}=\boldsymbol{I}, \boldsymbol{B}_{11} \boldsymbol{A}_{12}+ \boldsymbol{B}_{12} \boldsymbol{A}_{22}=\mathbf{0} .$$	$$\boldsymbol{B}_{11} \boldsymbol{A}_{11}=\boldsymbol{I}, \boldsymbol{B}_{21} \boldsymbol{A}_{11}=\mathbf{0}, \boldsymbol{B}_{21} \boldsymbol{A}_{12}+ \boldsymbol{B}_{22} \boldsymbol{A}_{22}=\boldsymbol{I}, \boldsymbol{B}_{11} \boldsymbol{A}_{12}+ \boldsymbol{B}_{12} \boldsymbol{A}_{22}=\mathbf{0} .$$
lyche-numerical-linear-algebra_EQ0622 (9.17)	227	0.985	`\sigma_{1}=\max _{\substack{\boldsymbol{x} \in \mathbb{C}^{n} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{|\boldsymbol{A} \boldsymbol{x}|_{2}}{| \boldsymbol{x}|_{2}}, \quad \sigma_{n}=\min _{\substack{ \boldsymbol{x} \in \mathbb{C}^{n} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{|\boldsymbol{A} \boldsymbol{x} |_{2}}{|\boldsymbol{x}|_{2}} .`	$$\sigma_{1}=\max _{\substack{ \boldsymbol{x} \in \mathbb{C}^{n} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\|\boldsymbol{A} \boldsymbol{x}\|_{2}}{\|\boldsymbol{x}\|_{2}}, \quad \sigma_{n}=\min _{\substack{ \boldsymbol{x} \in \mathbb{C}^{n} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\|\boldsymbol{A} \boldsymbol{x}\|_{2}}{\|\boldsymbol{x}\|_{2}} .$$	$$\sigma_{1}=\max _{\substack{ \boldsymbol{x} \in \mathbb{C}^{n} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\|\boldsymbol{A} \boldsymbol{x}\|_{2}}{\|\boldsymbol{x}\|_{2}}, \quad \sigma_{n}=\min _{\substack{ \boldsymbol{x} \in \mathbb{C}^{n} \\ \boldsymbol{x} \neq \mathbf{0}}} \frac{\|\boldsymbol{A} \boldsymbol{x}\|_{2}}{\|\boldsymbol{x}\|_{2}} .$$
lyche-numerical-linear-algebra_EQ0272	113	0.986	`A=\left(\begin{array}{ccccc} 1 & -1 & 0 & \cdots & 0 \\ -1 & 2 & -1 & \ddots & \vdots \\ 0 & \ddots & \ddots & \ddots & 0 \\ \vdots & \ddots & -1 & 2 & -1 \\ 0 & \cdots & 0 & -1 & 2 \end{array}\right) .`	$$A=\left(\begin{array}{ccccc} 1 & -1 & 0 & \cdots & 0 \\ -1 & 2 & -1 & \ddots & \vdots \\ 0 & \ddots & \ddots & \ddots & 0 \\ \vdots & \ddots & -1 & 2 & -1 \\ 0 & \cdots & 0 & -1 & 2 \end{array}\right) .$$	$$A=\left(\begin{array}{ccccc} 1 & -1 & 0 & \cdots & 0 \\ -1 & 2 & -1 & \ddots & \vdots \\ 0 & \ddots & \ddots & \ddots & 0 \\ \vdots & \ddots & -1 & 2 & -1 \\ 0 & \cdots & 0 & -1 & 2 \end{array}\right) .$$

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lyche-numerical-linear-algebra_EQ0268	110	■ 0.986	`\boldsymbol{L} \boldsymbol{L}^{*}=\left[\begin{array}{ll} 0 & \mathbf{0}^{*} \\ \mathbf{0} & \boldsymbol{L}_{1} \end{array}\right]\left[\begin{array}{ll} 0 & \mathbf{0}^{*} \\ \mathbf{0} & \boldsymbol{L}_{1}^{*} \end{array}\right]=\left[\begin{array}{ll} 0 & \mathbf{0}^{*} \\ \mathbf{0} & \boldsymbol{B} \end{array}\right]=\boldsymbol{A} .`	$\boldsymbol{L}\boldsymbol{L}^{*}=\left[\begin{array}{ll} 0 & \mathbf{0}^{*} \\ \mathbf{0} & \boldsymbol{L}_{1} \end{array}\right]\left[\begin{array}{ll} 0 & \mathbf{0}^{*} \\ \mathbf{0} & \boldsymbol{L}_{1}^{*} \end{array}\right]=\left[\begin{array}{ll} 0 & \mathbf{0}^{*} \\ \mathbf{0} & \boldsymbol{B} \end{array}\right]=\boldsymbol{A}.$	$\boldsymbol{L}\boldsymbol{L}^{*}=\left[\begin{array}{ll} 0 & \mathbf{0}^{*} \\ \mathbf{0} & \boldsymbol{L}_{1} \end{array}\right]\left[\begin{array}{ll} 0 & \mathbf{0}^{*} \\ \mathbf{0} & \boldsymbol{L}_{1}^{*} \end{array}\right]=\left[\begin{array}{ll} 0 & \mathbf{0}^{*} \\ \mathbf{0} & \boldsymbol{B} \end{array}\right]=\boldsymbol{A}.$
lyche-numerical-linear-algebra_EQ0205 (3.14)	86	■ 0.986	`\boldsymbol{L}=\left[\begin{array}{ccc} 1 & & \ \ a_{p_{2}, 1}^{(1)} & 1 & \\ \vdots & & \ddots \ \ a_{p_{n}, 1}^{(1)} & a_{p_{n}, 2}^{(2)} & \cdots 1 \end{array}\right], \quad \boldsymbol{U}=\left[\begin{array}{ccc} a_{p_{1}, 1}^{(1)} & \cdots & a_{p_{1}, n}^{(1)} \\ & \ddots & \vdots \\ & & a_{p_{n}, n}^{(n)} \end{array}\right] .`	$\boldsymbol{L}=\left[\begin{array}{ccc} 1 & & \ \ a_{p_{2}, 1}^{(1)} & 1 & \\ \vdots & & \ddots \ \ a_{p_{n}, 1}^{(1)} & a_{p_{n}, 2}^{(2)} & \cdots 1 \end{array}\right], \quad \boldsymbol{U}=\left[\begin{array}{ccc} a_{p_{1}, 1}^{(1)} & \cdots & a_{p_{1}, n}^{(1)} \\ & \ddots & \vdots \\ & & a_{p_{n}, n}^{(n)} \end{array}\right] .$	$\boldsymbol{L}=\left[\begin{array}{ccc} 1 & & \ \ a_{p_{2}, 1}^{(1)} & 1 & \\ \vdots & & \ddots \ \ a_{p_{n}, 1}^{(1)} & a_{p_{n}, 2}^{(2)} & \cdots 1 \end{array}\right], \quad \boldsymbol{U}=\left[\begin{array}{ccc} a_{p_{1}, 1}^{(1)} & \cdots & a_{p_{1}, n}^{(1)} \\ & \ddots & \vdots \\ & & a_{p_{n}, n}^{(n)} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0995	336	■ 0.986	`\boldsymbol{A}_{1}=\left[\begin{array}{ccccc} d_{1} & c_{1} & & & \\ c_{1} & d_{2} & c_{2} & & \\ & \ddots & \ddots & \ddots & \\ & & c_{i-2} & d_{i-1} & c_{i-1} \\ & & & c_{i-1} & d_{i} \end{array}\right] \text { and } \boldsymbol{A}_{2}=\left[\begin{array}{ccccc} d_{i+1} & c_{i+1} & & & \\ c_{i+1} & d_{i+2} & c_{i+2} & & \\ & \ddots & \ddots & \ddots & \\ & & c_{n-2} & d_{n-1} & c_{n-1} \\ & & & c_{n-1} & d_{n} \end{array}\right] .`	$\boldsymbol{A}_{1}=\left[\begin{array}{ccccc} d_{1} & c_{1} & & & \\ c_{1} & d_{2} & c_{2} & & \\ & \ddots & \ddots & \ddots & \\ & & c_{i-2} & d_{i-1} & c_{i-1} \\ & & & c_{i-1} & d_{i} \end{array}\right] \text { and } \boldsymbol{A}_{2}=\left[\begin{array}{ccccc} d_{i+1} & c_{i+1} & & & \\ c_{i+1} & d_{i+2} & c_{i+2} & & \\ & \ddots & \ddots & \ddots & \\ & & c_{n-2} & d_{n-1} & c_{n-1} \\ & & & c_{n-1} & d_{n} \end{array}\right] .$	$\boldsymbol{A}_{1}=\left[\begin{array}{ccccc} d_{1} & c_{1} & & & \\ c_{1} & d_{2} & c_{2} & & \\ & \ddots & \ddots & \ddots & \\ & & c_{i-2} & d_{i-1} & c_{i-1} \\ & & & c_{i-1} & d_{i} \end{array}\right] \text { and } \boldsymbol{A}_{2}=\left[\begin{array}{ccccc} d_{i+1} & c_{i+1} & & & \\ c_{i+1} & d_{i+2} & c_{i+2} & & \\ & \ddots & \ddots & \ddots & \\ & & c_{n-2} & d_{n-1} & c_{n-1} \\ & & & c_{n-1} & d_{n} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0300	124	■ 0.987	`\langle U x, U y\rangle=(U y)^{*}(U x)=y^{*} U^{*} U x=y^{*} x=\langle x, y\rangle .`	$\langle Ux, Uy\rangle=(Uy)^{*}(Ux)=y^{*}U^{*}Ux=y^{*}x=\langle x, y\rangle.$	$\langle \boldsymbol{U}\boldsymbol{x}, \boldsymbol{U}\boldsymbol{y}\rangle=(\boldsymbol{U}\boldsymbol{y})^{*}(\boldsymbol{U}\boldsymbol{x})=\boldsymbol{y}^{*}\boldsymbol{U}^{*}\boldsymbol{U}\boldsymbol{x}=\boldsymbol{y}^{*}\boldsymbol{x}=\langle \boldsymbol{x}, \boldsymbol{y}\rangle.$
lyche-numerical-linear-algebra_EQ0426 (7.5)	172	■ 0.987	`\boldsymbol{A}=\boldsymbol{U} \boldsymbol{\Sigma} \boldsymbol{V}^{*}=\boldsymbol{U}_{1} \boldsymbol{ \Sigma}_{1} \boldsymbol{V}_{1}^{*} .`	$\boldsymbol{A}=\boldsymbol{U} \boldsymbol{\Sigma} \boldsymbol{V}^{*}=\boldsymbol{U}_{1} \boldsymbol{\Sigma}_{1} \boldsymbol{V}_{1}^{*}.$	$\boldsymbol{A}=\boldsymbol{U} \boldsymbol{\Sigma} \boldsymbol{V}^{*}=\boldsymbol{U}_{1} \boldsymbol{\Sigma}_{1} \boldsymbol{V}_{1}^{*}.$
lyche-numerical-linear-algebra_EQ0397 (6.15)	159	■ 0.987	`\sum_{j=1}^{n}\left\mu_{i_{j}}-\lambda_{j}\right|^{2} \leq \sum_{i=1}^{n} \sum_{j=1}^{n}\left|a_{i j}-b_{i j} \right|^{2}`	$\sum_{j=1}^{n}\left\|\mu_{i_{j}}-\lambda_{j}\right\|^{2} \leq \sum_{i=1}^{n} \sum_{j=1}^{n}\left\|a_{i j}-b_{i j} \right\|^{2}$	$\sum_{j=1}^{n}\left\|\mu_{i_{j}}-\lambda_{j}\right\|^{2} \leq \sum_{i=1}^{n} \sum_{j=1}^{n}\left\|a_{i j}-b_{i j} \right\|^{2}.$
lyche-numerical-linear-algebra_EQ0511	199	■ 0.987	`\\|\boldsymbol{x}\\|_{p}:=\left(\sum_{j=1}^{n}\left|x_{j} \right|^{p}\right)^{1 / p}, \quad\\|\boldsymbol{x}\\|_{ \infty}:=\max _{1 \leq j \leq n}\left|x_{j}\right| .`	$\\|\boldsymbol{x}\\|_{p}:=\left(\sum_{j=1}^{n}\left\|x_{j} \right\|^{p}\right)^{1 / p}, \quad\\|\boldsymbol{x}\\|_{ \infty}:=\max _{1 \leq j \leq n}\left\|x_{j}\right\| .$	$\\|\boldsymbol{x}\\|_{p}:=\left(\sum_{j=1}^{n}\left\|x_{j} \right\|^{p}\right)^{1 / p}, \quad\\|\boldsymbol{x}\\|_{ \infty}:=\max _{1 \leq j \leq n}\left\|x_{j}\right\| .$

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lyche-numerical-linear-algebra_EQ0139	64	0.987	\boldsymbol{A} \boldsymbol{B}=\left[\left[\begin{array}{ll} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \boldsymbol{A}_{21} & \boldsymbol{A}_{22} \end{array}\right] \left[\begin{array}{l} \boldsymbol{B}_{11} \\ \boldsymbol{B}_{21} \end{array}\right], \left[\begin{array}{ll} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \boldsymbol{A}_{21} & \boldsymbol{A}_{22} \end{array}\right]\left[\begin{array}{l} \boldsymbol{B}_{12} \\ \boldsymbol{B}_{22} \end{array}\right]\right] .	$\boldsymbol{A}\boldsymbol{B}=\left[\left[\begin{array}{ll} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \boldsymbol{A}_{21} & \boldsymbol{A}_{22} \end{array}\right] \left[\begin{array}{l} \boldsymbol{B}_{11} \\ \boldsymbol{B}_{21} \end{array}\right], \left[\begin{array}{ll} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \boldsymbol{A}_{21} & \boldsymbol{A}_{22} \end{array}\right]\left[\begin{array}{l} \boldsymbol{B}_{12} \\ \boldsymbol{B}_{22} \end{array}\right]\right] .$	$\boldsymbol{A}\boldsymbol{B}=\left[\left[\begin{array}{ll} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \boldsymbol{A}_{21} & \boldsymbol{A}_{22} \end{array}\right] \left[\begin{array}{l} \boldsymbol{B}_{11} \\ \boldsymbol{B}_{21} \end{array}\right], \left[\begin{array}{ll} \boldsymbol{A}_{11} & \boldsymbol{A}_{12} \\ \boldsymbol{A}_{21} & \boldsymbol{A}_{22} \end{array}\right]\left[\begin{array}{l} \boldsymbol{B}_{12} \\ \boldsymbol{B}_{22} \end{array}\right]\right] .$
lyche-numerical-linear-algebra_EQ0164 (2.38)	73	0.987	\boldsymbol{L}=\left[\begin{array}{ccccc} 1 & 0 & \cdots & \cdots & 0 \\ -\frac{1}{2} & 1 & \ddots & & \vdots \\ 0 & -\frac{2}{3} & 1 & \ddots & \vdots \\ \vdots & \ddots & \ddots & \ddots & 0 \\ 0 & \cdots & 0 & -\frac{m-1}{m} & 1 \end{array}\right], \boldsymbol{U}= \left[\begin{array}{ccccc} 2 & -1 & 0 & \cdots & 0 \\ \frac{3}{2} & -1 & \ddots & \vdots & \vdots \\ \vdots & \ddots & \ddots & \ddots & 0 \\ \vdots & \ddots & \frac{m}{m-1} & -1 & \\ 0 & \cdots & \cdots & 0 & \frac{m+1}{m} \end{array}\right] .	$\boldsymbol{L}=\left[\begin{array}{ccccc} 1 & 0 & \cdots & \cdots & 0 \\ -\frac{1}{2} & 1 & \ddots & & \vdots \\ 0 & -\frac{2}{3} & 1 & \ddots & \vdots \\ \vdots & \ddots & \ddots & \ddots & 0 \\ 0 & \cdots & 0 & -\frac{m-1}{m} & 1 \end{array}\right], \boldsymbol{U}=\left[\begin{array}{ccccc} 2 & -1 & 0 & \cdots & 0 \\ \frac{3}{2} & -1 & \ddots & \vdots & \vdots \\ \vdots & \ddots & \ddots & \ddots & 0 \\ \vdots & \ddots & \frac{m}{m-1} & -1 & \\ 0 & \cdots & \cdots & 0 & \frac{m+1}{m} \end{array}\right] .$	$\boldsymbol{L}=\left[\begin{array}{ccccc} 1 & 0 & \cdots & \cdots & 0 \\ -\frac{1}{2} & 1 & \ddots & & \vdots \\ 0 & -\frac{2}{3} & 1 & \ddots & \vdots \\ \vdots & \ddots & \ddots & \ddots & 0 \\ 0 & \cdots & 0 & -\frac{m-1}{m} & 1 \end{array}\right], \boldsymbol{U}=\left[\begin{array}{ccccc} 2 & -1 & 0 & \cdots & 0 \\ \frac{3}{2} & -1 & \ddots & \vdots & \vdots \\ \vdots & \ddots & \ddots & \ddots & 0 \\ \vdots & \ddots & \frac{m}{m-1} & -1 & \\ 0 & \cdots & \cdots & 0 & \frac{m+1}{m} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0572	212	0.988	S_{p}=\left\{\boldsymbol{x} \in \mathbb{R}^{n}:| \boldsymbol{x}|_{p}=1\right\}	$S_p=\{\boldsymbol{x} \in \mathbb{R}^{n}:\|\boldsymbol{x}\|_{p}=1\}$	$S_p=\{\boldsymbol{x} \in \mathbb{R}^{n}:\|\boldsymbol{x}\|_{p}=1\}$
lyche-numerical-linear-algebra_EQ0949 (13.62)	321	0.988	\begin{aligned} \langle\boldsymbol{x}, \boldsymbol{y} \rangle & =\langle\boldsymbol{y}, \boldsymbol{x}\rangle, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n}, \\ \langle\boldsymbol{C} \boldsymbol{x}, \boldsymbol{y} \rangle & =\left\langle\boldsymbol{y}, \boldsymbol{C}^{T} \boldsymbol{x}\right\rangle \stackrel{(13.61)}{=}\left \langle\boldsymbol{C}^{T} \boldsymbol{x}, \boldsymbol{y} \right\rangle, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n}, \boldsymbol{C} \in \mathbb{R}^{n \times n} . \end{aligned}	$\begin{aligned} \langle\boldsymbol{x}, \boldsymbol{y} \rangle & =\langle\boldsymbol{y}, \boldsymbol{x}\rangle, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n}, \\ \langle\boldsymbol{C} \boldsymbol{x}, \boldsymbol{y} \rangle & =\left\langle\boldsymbol{y}, \boldsymbol{C}^{T} \boldsymbol{x}\right\rangle \stackrel{(13.61)}{=}\left \langle\boldsymbol{C}^{T} \boldsymbol{x}, \boldsymbol{y} \right\rangle, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n}, \boldsymbol{C} \in \mathbb{R}^{n \times n} . \end{aligned}$	$\begin{aligned} \langle\boldsymbol{x}, \boldsymbol{y} \rangle & =\langle\boldsymbol{y}, \boldsymbol{x}\rangle, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n}, \\ \langle\boldsymbol{C} \boldsymbol{x}, \boldsymbol{y} \rangle & =\left\langle\boldsymbol{y}, \boldsymbol{C}^{T} \boldsymbol{x}\right\rangle \stackrel{(13.61)}{=}\left \langle\boldsymbol{C}^{T} \boldsymbol{x}, \boldsymbol{y} \right\rangle, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n}, \boldsymbol{C} \in \mathbb{R}^{n \times n} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0166	73	0.988	\boldsymbol{A} \boldsymbol{B}^{T}=\boldsymbol{a}_{: 1} \boldsymbol{b}_{: 1}^{T}+\boldsymbol{a}_{: 2} \boldsymbol{b}_{: 2}^{T}+\cdots+\boldsymbol{a}_{: n} \boldsymbol{b}_{: n}^{T} .	$\boldsymbol{A}\boldsymbol{B}^{T}=\boldsymbol{a}_{: 1} \boldsymbol{b}_{: 1}^{T}+\boldsymbol{a}_{: 2} \boldsymbol{b}_{: 2}^{T}+\cdots+\boldsymbol{a}_{: n} \boldsymbol{b}_{: n}^{T} .$	$\boldsymbol{A}\boldsymbol{B}^{T}=\boldsymbol{a}_{: 1} \boldsymbol{b}_{: 1}^{T}+\boldsymbol{a}_{: 2} \boldsymbol{b}_{: 2}^{T}+\cdots+\boldsymbol{a}_{: n} \boldsymbol{b}_{: n}^{T} .$
lyche-numerical-linear-algebra_EQ0589	217	0.989	\boldsymbol{H}_{3}=\left[\begin{array}{lll} 1 & \frac{1}{2} & \frac{1}{3} \\ \frac{1}{2} & \frac{1}{3} & \frac{1}{4} \\ \frac{1}{3} & \frac{1}{4} & \frac{1}{5} \end{array}\right] .	$\boldsymbol{H}_{3}=\left[\begin{array}{lll} 1 & \frac{1}{2} & \frac{1}{3} \\ \frac{1}{2} & \frac{1}{3} & \frac{1}{4} \\ \frac{1}{3} & \frac{1}{4} & \frac{1}{5} \end{array}\right] .$	$\boldsymbol{H}_{3}=\left[\begin{array}{lll} 1 & \frac{1}{2} & \frac{1}{3} \\ \frac{1}{2} & \frac{1}{3} & \frac{1}{4} \\ \frac{1}{3} & \frac{1}{4} & \frac{1}{5} \end{array}\right] .$

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lyche-numerical-linear-algebra_EQ0911 (13.44)	310	0.989	\boldsymbol{B} \boldsymbol{A} \boldsymbol{x}= \boldsymbol{B} \boldsymbol{b} \Leftrightarrow \boldsymbol{C}^{T}\left(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}\right) \boldsymbol{C}^{-T} \boldsymbol{x}=\boldsymbol{C}^{T} \boldsymbol{C} \boldsymbol{b} \Leftrightarrow\left(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}\right) \boldsymbol{y}= \boldsymbol{C} \boldsymbol{b},	$\boldsymbol{B}\boldsymbol{A}\boldsymbol{x}=\boldsymbol{B}\boldsymbol{b} \Leftrightarrow \boldsymbol{C}^{T}\left(\boldsymbol{C}\boldsymbol{A}\boldsymbol{C}^{T}\right)\boldsymbol{C}^{-T}\boldsymbol{x}=\boldsymbol{C}^{T}\boldsymbol{C}\boldsymbol{b} \Leftrightarrow\left(\boldsymbol{C}\boldsymbol{A}\boldsymbol{C}^{T}\right)\boldsymbol{y}=\boldsymbol{C}\boldsymbol{b},$	$\boldsymbol{B}\boldsymbol{A}\boldsymbol{x}=\boldsymbol{B}\boldsymbol{b} \Leftrightarrow \boldsymbol{C}^{T}\left(\boldsymbol{C}\boldsymbol{A}\boldsymbol{C}^{T}\right)\boldsymbol{C}^{-T}\boldsymbol{x}=\boldsymbol{C}^{T}\boldsymbol{C}\boldsymbol{b} \Leftrightarrow\left(\boldsymbol{C}\boldsymbol{A}\boldsymbol{C}^{T}\right)\boldsymbol{y}=\boldsymbol{C}\boldsymbol{b},$
lyche-numerical-linear-algebra_EQ0500	195	0.989	\\|\boldsymbol{A} \boldsymbol{B}\\| \leq\\|\boldsymbol{A} \\|\\|\boldsymbol{B}\\| \text { and }\\|\boldsymbol{A} \boldsymbol{x}\\| \leq\\|\boldsymbol{A}\\|\\|\boldsymbol{x}\\| .	$\\|\boldsymbol{A}\boldsymbol{B}\\| \leq\\|\boldsymbol{A}\\|\\|\boldsymbol{B}\\| \text { and }\\|\boldsymbol{A}\boldsymbol{x}\\| \leq\\|\boldsymbol{A}\\|\\|\boldsymbol{x}\\|.$	$\\|\boldsymbol{A}\boldsymbol{B}\\| \leq\\|\boldsymbol{A}\\|\\|\boldsymbol{B}\\| \text { and }\\|\boldsymbol{A}\boldsymbol{x}\\| \leq\\|\boldsymbol{A}\\|\\|\boldsymbol{x}\\|.$
lyche-numerical-linear-algebra_EQ0137	64	0.989	\begin{aligned} (\boldsymbol{A} \boldsymbol{B})_{i j} & =\sum_{k=1}^{p} a_{i k} b_{k j}=\sum_{k=1}^{s} a_{i k} b_{k j}+\sum_{k=s+1}^{p} a_{i k} b_{k j} \\ & =\left(\boldsymbol{A}_{1} \boldsymbol{B}_{1}\right)_{i j}+\left(\boldsymbol{A}_{2} \boldsymbol{B}_{2}\right)_{i j}=\left(\boldsymbol{A}_{1} \boldsymbol{B}_{1}+\boldsymbol{A}_{2} \boldsymbol{B}_{2}\right)_{i j} . \end{aligned}	$\begin{aligned} (\boldsymbol{A}\boldsymbol{B})_{ij} &= \sum_{k=1}^{p} a_{ik}b_{kj} = \sum_{k=1}^{s} a_{ik}b_{kj} + \sum_{k=s+1}^{p} a_{ik}b_{kj} \\ &= (\boldsymbol{A}_1\boldsymbol{B}_1)_{ij} + (\boldsymbol{A}_2\boldsymbol{B}_2)_{ij} = (\boldsymbol{A}_1\boldsymbol{B}_1 + \boldsymbol{A}_2\boldsymbol{B}_2)_{ij}\,. \end{aligned}$	$\begin{aligned} (\boldsymbol{A}\boldsymbol{B})_{ij} &= \sum_{k=1}^{p} a_{ik}b_{kj} = \sum_{k=1}^{s} a_{ik}b_{kj} + \sum_{k=s+1}^{p} a_{ik}b_{kj} \\ &= (\boldsymbol{A}_1\boldsymbol{B}_1)_{ij} + (\boldsymbol{A}_2\boldsymbol{B}_2)_{ij} = (\boldsymbol{A}_1\boldsymbol{B}_1 + \boldsymbol{A}_2\boldsymbol{B}_2)_{ij}\,. \end{aligned}$
lyche-numerical-linear-algebra_EQ0436 (7.7)	174	0.989	\begin{aligned} \boldsymbol{A} \boldsymbol{v}_{i} & =\sigma_{i} \boldsymbol{u}_{i}, i=1, \ldots, r, \quad \boldsymbol{A} \boldsymbol{v}_{i}=0, i=r+1, \ldots, n, \\ \boldsymbol{A}^{*} \boldsymbol{u}_{i} & =\sigma_{i} \boldsymbol{v}_{i}, i=1, \ldots, r, \quad \boldsymbol{A}^{*} \boldsymbol{u}_{i}=0, i=r+1, \ldots, m . \end{aligned}	$\begin{aligned} \boldsymbol{A}\boldsymbol{v}_i &= \sigma_i\boldsymbol{u}_i, i=1,\ldots,r, \quad \boldsymbol{A}\boldsymbol{v}_i = 0, i=r+1,\ldots,n, \\ \boldsymbol{A}^*\boldsymbol{u}_i &= \sigma_i\boldsymbol{v}_i, i=1,\ldots,r, \quad \boldsymbol{A}^*\boldsymbol{u}_i = 0, i=r+1,\ldots,m. \end{aligned}$	$\begin{aligned} \boldsymbol{A}\boldsymbol{v}_i &= \sigma_i\boldsymbol{u}_i,\ i=1,\ldots,r, \quad \boldsymbol{A}\boldsymbol{v}_i = 0,\ i=r+1,\ldots,n, \\ \boldsymbol{A}^*\boldsymbol{u}_i &= \sigma_i\boldsymbol{v}_i,\ i=1,\ldots,r, \quad \boldsymbol{A}^*\boldsymbol{u}_i = 0,\ i=r+1,\ldots,m. \end{aligned}$
lyche-numerical-linear-algebra_EQ0001	21	0.990	\boldsymbol{x}=\left[\begin{array}{c} x_{1} \\ x_{2} \\ \vdots \\ x_{n} \end{array}\right],	$\boldsymbol{x}=\left[\begin{array}{c} x_{1} \\ x_{2} \\ \vdots \\ x_{n} \end{array}\right],$	$\boldsymbol{x}=\left[\begin{array}{c} x_{1} \\ x_{2} \\ \vdots \\ x_{n} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0060	41	0.990	\left(\boldsymbol{A}+\boldsymbol{B} \boldsymbol{C}^{T} \right)^{-1}=\boldsymbol{A}^{-1}-\boldsymbol{A}^{-1} \boldsymbol{B}\left(\boldsymbol{I}+\boldsymbol{C}^{T} \boldsymbol{A}^{-1} \boldsymbol{B}\right)^{-1} \boldsymbol{C}^{T} \boldsymbol{A}^{-1} .	$\left(\boldsymbol{A}+\boldsymbol{B}\boldsymbol{C}^{T}\right)^{-1}=\boldsymbol{A}^{-1}-\boldsymbol{A}^{-1}\boldsymbol{B}\left(\boldsymbol{I}+\boldsymbol{C}^{T}\boldsymbol{A}^{-1}\boldsymbol{B}\right)^{-1}\boldsymbol{C}^{T}\boldsymbol{A}^{-1}.$	$\left(\boldsymbol{A}+\boldsymbol{B}\boldsymbol{C}^{T}\right)^{-1}=\boldsymbol{A}^{-1}-\boldsymbol{A}^{-1}\boldsymbol{B}\left(\boldsymbol{I}+\boldsymbol{C}^{T}\boldsymbol{A}^{-1}\boldsymbol{B}\right)^{-1}\boldsymbol{C}^{T}\boldsymbol{A}^{-1}.$

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lyche-numerical-linear-algebra_EQ0231 (3.21)	92	0.990	`\begin{aligned} \boldsymbol{A} & =\left[\begin{array}{cc} \boldsymbol{A}_{\{m-1\}} & \boldsymbol{B} \\ \boldsymbol{C}^{T} & \boldsymbol{A}_{m m} \end{array} \right] \\ & =\left[\begin{array}{cc} \boldsymbol{L}_{ \{m-1\}} & \mathbf{0} \\ \boldsymbol{C}^{T} \boldsymbol{U}_{\{m-1\}}^{-1} & \boldsymbol{I} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{U}_{\{m-1\}} & \boldsymbol{L}_{\{m-1 \}}^{-1} \boldsymbol{B} \\ 0 & \boldsymbol{A}_{m m}- \boldsymbol{C}^{T} \boldsymbol{U}_{\{m-1\}}^{-1} \boldsymbol{L}_{\{m-1\}}^{-1} \boldsymbol{B} \end{array}\right], \end{aligned}`	$\begin{aligned} \boldsymbol{A} & =\left[\begin{array}{cc} \boldsymbol{A}_{\{m-1\}} & \boldsymbol{B} \\ \boldsymbol{C}^{T} & \boldsymbol{A}_{m m} \end{array} \right] \\ & =\left[\begin{array}{cc} \boldsymbol{L}_{ \{m-1\}} & \mathbf{0} \\ \boldsymbol{C}^{T} \boldsymbol{U}_{\{m-1\}}^{-1} & \boldsymbol{I} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{U}_{\{m-1\}} & \boldsymbol{L}_{\{m-1 \}}^{-1} \boldsymbol{B} \\ 0 & \boldsymbol{A}_{m m}- \boldsymbol{C}^{T} \boldsymbol{U}_{\{m-1\}}^{-1} \boldsymbol{L}_{\{m-1\}}^{-1} \boldsymbol{B} \end{array}\right], \end{aligned}$	$\begin{aligned} \boldsymbol{A} & =\left[\begin{array}{cc} \boldsymbol{A}_{\{m-1\}} & \boldsymbol{B} \\ \boldsymbol{C}^{T} & \boldsymbol{A}_{m m} \end{array} \right] \\ & =\left[\begin{array}{cc} \boldsymbol{L}_{ \{m-1\}} & \mathbf{0} \\ \boldsymbol{C}^{T} \boldsymbol{U}_{\{m-1\}}^{-1} & \boldsymbol{I} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{U}_{\{m-1\}} & \boldsymbol{L}_{\{m-1 \}}^{-1} \boldsymbol{B} \\ 0 & \boldsymbol{A}_{m m}- \boldsymbol{C}^{T} \boldsymbol{U}_{\{m-1\}}^{-1} \boldsymbol{L}_{\{m-1\}}^{-1} \boldsymbol{B} \end{array}\right], \end{aligned}$
lyche-numerical-linear-algebra_EQ0293 (5.9)	122	0.990	`\left\langle\boldsymbol{s}_{0}, \boldsymbol{s}\right \rangle=\langle\boldsymbol{v}, \boldsymbol{s}\rangle, \quad \text { for all } \boldsymbol{s} \in \mathcal{S}, \quad\left\langle\boldsymbol{t}_{0}, \boldsymbol{t}\right \rangle=\langle\boldsymbol{v}, \boldsymbol{t}\rangle, \quad \text { for all } \boldsymbol{t} \in \mathcal{T} .`	$\langle \boldsymbol{s}_0, \boldsymbol{s}\rangle = \langle \boldsymbol{v}, \boldsymbol{s}\rangle, \quad \text{for all } \boldsymbol{s} \in \mathcal{S}, \quad \langle \boldsymbol{t}_0, \boldsymbol{t}\rangle = \langle \boldsymbol{v}, \boldsymbol{t}\rangle, \quad \text{for all } \boldsymbol{t} \in \mathcal{T}.$	$\langle \boldsymbol{s}_0, \boldsymbol{s}\rangle = \langle \boldsymbol{v}, \boldsymbol{s}\rangle, \quad \text{for all } \boldsymbol{s} \in \mathcal{S}, \quad \langle \boldsymbol{t}_0, \boldsymbol{t}\rangle = \langle \boldsymbol{v}, \boldsymbol{t}\rangle, \quad \text{for all } \boldsymbol{t} \in \mathcal{T}.$
lyche-numerical-linear-algebra_EQ0543	206	0.990	`\left\\|\boldsymbol{A}^{-1}\right\\|_{2}=\max _{ \boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{x} \\|_{2}}{\\|\boldsymbol{A} \boldsymbol{x}\\|_{2}} .`	$\left\\|\boldsymbol{A}^{-1}\right\\|_{2}=\max _{ \boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{x} \\|_{2}}{\\|\boldsymbol{A} \boldsymbol{x}\\|_{2}} .$	$\left\\|\boldsymbol{A}^{-1}\right\\|_{2}=\max _{ \boldsymbol{x} \neq \mathbf{0}} \frac{\\|\boldsymbol{x} \\|_{2}}{\\|\boldsymbol{A} \boldsymbol{x}\\|_{2}} .$
lyche-numerical-linear-algebra_EQ0920 (13.52)	313	0.990	`\begin{aligned} -\frac{\partial}{\partial x}\left(c(x, y) \frac{\partial u}{\partial x}\right)-\frac{\partial}{ \partial y}\left(c(x, y) \frac{\partial u}{\partial y} \right) & =f(x, y), & & (x, y) \in \Omega=(0,1)^{2}, \\ u(x, y) & =0, & & (x, y) \in \partial \Omega . \end{aligned}`	$\begin{aligned} -\frac{\partial}{\partial x}\left(c(x, y) \frac{\partial u}{\partial x}\right)-\frac{\partial}{ \partial y}\left(c(x, y) \frac{\partial u}{\partial y} \right) & =f(x, y), & & (x, y) \in \Omega=(0,1)^{2}, \\ u(x, y) & =0, & & (x, y) \in \partial \Omega . \end{aligned}$	$\begin{aligned} -\frac{\partial}{\partial x}\left(c(x, y) \frac{\partial u}{\partial x}\right)-\frac{\partial}{ \partial y}\left(c(x, y) \frac{\partial u}{\partial y} \right) & =f(x, y), & & (x, y) \in \Omega=(0,1)^{2}, \\ u(x, y) & =0, & & (x, y) \in \partial \Omega . \end{aligned}$
lyche-numerical-linear-algebra_EQ0679	244	0.990	`((\boldsymbol{A} \otimes \boldsymbol{B})(\boldsymbol{C} \otimes \boldsymbol{D}))_{i, j}=\boldsymbol{A} \boldsymbol{C} \sum_{k=1}^{t} b_{i, k} d_{k, j}=(\boldsymbol{A} \boldsymbol{C})(\boldsymbol{B} \boldsymbol{D})_{i, j}=((\boldsymbol{A} \boldsymbol{C}) \otimes(\boldsymbol{B} \boldsymbol{D}))_{i, j} .`	$((\boldsymbol{A} \otimes \boldsymbol{B})(\boldsymbol{C} \otimes \boldsymbol{D}))_{i, j}=\boldsymbol{A} \boldsymbol{C} \sum_{k=1}^{t} b_{i, k} d_{k, j}=(\boldsymbol{A} \boldsymbol{C})(\boldsymbol{B} \boldsymbol{D})_{i, j}=((\boldsymbol{A} \boldsymbol{C}) \otimes(\boldsymbol{B} \boldsymbol{D}))_{i, j} .$	$((\boldsymbol{A} \otimes \boldsymbol{B})(\boldsymbol{C} \otimes \boldsymbol{D}))_{i, j}=\boldsymbol{A} \boldsymbol{C} \sum_{k=1}^{t} b_{i, k} d_{k, j}=(\boldsymbol{A} \boldsymbol{C})(\boldsymbol{B} \boldsymbol{D})_{i, j}=((\boldsymbol{A} \boldsymbol{C}) \otimes(\boldsymbol{B} \boldsymbol{D}))_{i, j} .$
lyche-numerical-linear-algebra_EQ0042	36	0.991	`\begin{aligned} \left|\begin{array}{ccc} 1 & x & y \ \ 1 & x_{1} & y_{1} \\ 1 & x_{2} & y_{2} \end{array} \right| & =\left|\begin{array}{ccc} 1 & x & y \\ 0 & x_{1}-x & y_{1}-y \\ 0 & x_{2}-x_{1} & y_{2}-y_{1} \end{array}\right| \\ & =\left|\begin{array}{cc} x_{1}-x & y_{1}-y \\ x_{2}-x_{1} & y_{2}-y_{1} \end{array}\right|=\left(x_{1}-x\right)\left(y_{2}-y_{1} \right)-\left(y_{1}-y\right)\left(x_{2}-x_{1}\right) \end{aligned}`	$\begin{aligned} \left\|\begin{array}{ccc} 1 & x & y \ \ 1 & x_{1} & y_{1} \\ 1 & x_{2} & y_{2} \end{array} \right\| & =\left\|\begin{array}{ccc} 1 & x & y \\ 0 & x_{1}-x & y_{1}-y \\ 0 & x_{2}-x_{1} & y_{2}-y_{1} \end{array}\right\| \\ & =\left\|\begin{array}{cc} x_{1}-x & y_{1}-y \\ x_{2}-x_{1} & y_{2}-y_{1} \end{array}\right\|=\left(x_{1}-x\right)\left(y_{2}-y_{1} \right)-\left(y_{1}-y\right)\left(x_{2}-x_{1}\right) \end{aligned}$	$\begin{aligned} \left\|\begin{array}{ccc} 1 & x & y \ \ 1 & x_{1} & y_{1} \\ 1 & x_{2} & y_{2} \end{array} \right\| & =\left\|\begin{array}{ccc} 1 & x & y \\ 0 & x_{1}-x & y_{1}-y \\ 0 & x_{2}-x_{1} & y_{2}-y_{1} \end{array}\right\| \\ & =\left\|\begin{array}{cc} x_{1}-x & y_{1}-y \\ x_{2}-x_{1} & y_{2}-y_{1} \end{array}\right\|=\left(x_{1}-x\right)\left(y_{2}-y_{1} \right)-\left(y_{1}-y\right)\left(x_{2}-x_{1}\right) \end{aligned}$
lyche-numerical-linear-algebra_EQ0213	87	0.991	`\mathrm{fl}\left(x_{2}\right)=2, \quad \mathrm{fl} \left(x_{1}\right)=0 .`	$\mathrm{fl}\left(x_{2}\right)=2, \quad \mathrm{fl} \left(x_{1}\right)=0 .$	$\mathrm{fl}\left(x_{2}\right)=2, \quad \mathrm{fl} \left(x_{1}\right)=0 .$

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lyche-numerical-linear-algebra_EQ0234 (3.25)	94	0.991	`\begin{aligned} 1+2+\cdots+m & =\frac{1}{2} m(m+1), \\ 1^{2}+2^{2}+\cdots+m^{2} & =\frac{1}{3} m\left(m+\frac{1}{2}\right)(m+1), \\ 1+3+5+\cdots+2 m-1 & =m^{2}, \\ 1 * 2+2 * 3+3 * 4+\cdots+(m-1) m & =\frac{1}{3}(m-1) m(m+1) . \end{aligned}`	$$\begin{aligned} 1+2+\cdots+m &= \frac{1}{2} m(m+1), \\ 1^{2}+2^{2}+\cdots+m^{2} &= \frac{1}{3} m\left(m+\frac{1}{2}\right)(m+1), \\ 1+3+5+\cdots+2 m-1 &= m^{2}, \\ 1 * 2+2 * 3+3 * 4+\cdots+(m-1) m &= \frac{1}{3}(m-1) m(m+1). \end{aligned}$$	$$\begin{aligned} 1+2+\cdots+m &= \frac{1}{2} m(m+1), \\ 1^{2}+2^{2}+\cdots+m^{2} &= \frac{1}{3} m(m+\frac{1}{2})(m+1), \\ 1+3+5+\cdots+2 m-1 &= m^{2}, \\ 1 * 2+2 * 3+3 * 4+\cdots+(m-1) m &= \frac{1}{3}(m-1) m(m+1). \end{aligned}$$
lyche-numerical-linear-algebra_EQ0468 (8.2)	186	0.991	`\\|\boldsymbol{x}\\|_{p}:=\\|\boldsymbol{x}\\|_{\infty} \left(\sum_{j=1}^{n}\left(\frac{\left|x_{j}\right|}{\\| \boldsymbol{x}\\|_{\infty}}\right)^{p}\right)^{1 / p} .`	$$\\|\boldsymbol{x}\\|_{p}:=\\|\boldsymbol{x}\\|_{\infty} \left(\sum_{j=1}^{n}\left(\frac{\left\|x_{j}\right\|}{\\|\boldsymbol{x}\\|_{\infty}}\right)^{p}\right)^{1 / p} .$$	$$\\|\boldsymbol{x}\\|_{p}:=\\|\boldsymbol{x}\\|_{\infty} \left(\sum_{j=1}^{n}\left(\frac{\left\|x_{j}\right\|}{\\|\boldsymbol{x}\\|_{\infty}}\right)^{p}\right)^{1 / p} .$$
lyche-numerical-linear-algebra_EQ0584 (9.1)	216	0.991	`\boldsymbol{A} \boldsymbol{x}=\left[\begin{array}{c} p \left(t_{1}\right) \\ \vdots \\ p\left(t_{m}\right) \end{array}\right]=\left[\begin{array}{ccc} \phi_{1} \left(t_{1}\right) & \cdots & \phi_{n}\left(t_{1} \right) \\ \vdots & & \vdots \\ \phi_{1}\left(t_{m} \right) & \cdots & \phi_{n}\left(t_{m}\right) \end{array} \right]\left[\begin{array}{c} x_{1} \\ \vdots \\ x_{n} \end{array}\right]=\left[\begin{array}{c} y_{1} \\ \vdots \\ y_{m} \end{array}\right]=: \boldsymbol{b} .`	$$\boldsymbol{A} \boldsymbol{x}=\left[\begin{array}{c} p \left(t_{1}\right) \\ \vdots \\ p\left(t_{m}\right) \end{array}\right]=\left[\begin{array}{ccc} \phi_{1} \left(t_{1}\right) & \cdots & \phi_{n}\left(t_{1} \right) \\ \vdots & & \vdots \\ \phi_{1}\left(t_{m} \right) & \cdots & \phi_{n}\left(t_{m}\right) \end{array} \right]\left[\begin{array}{c} x_{1} \\ \vdots \\ x_{n} \end{array}\right]=\left[\begin{array}{c} y_{1} \\ \vdots \\ y_{m} \end{array}\right]=: \boldsymbol{b} .$$	$$\boldsymbol{A} \boldsymbol{x}=\left[\begin{array}{c} p \left(t_{1}\right) \\ \vdots \\ p\left(t_{m}\right) \end{array}\right]=\left[\begin{array}{ccc} \phi_{1} \left(t_{1}\right) & \cdots & \phi_{n}\left(t_{1} \right) \\ \vdots & & \vdots \\ \phi_{1}\left(t_{m} \right) & \cdots & \phi_{n}\left(t_{m}\right) \end{array} \right]\left[\begin{array}{c} x_{1} \\ \vdots \\ x_{n} \end{array}\right]=\left[\begin{array}{c} y_{1} \\ \vdots \\ y_{m} \end{array}\right]=: \boldsymbol{b} .$$
lyche-numerical-linear-algebra_EQ0725	258	0.991	`\boldsymbol{F}_{4} \boldsymbol{P}_{4}=\left[ \begin{array}{r|r} \boldsymbol{F}_{2} & \boldsymbol{D}_{2} \boldsymbol{F}_{2} \\ \hline \boldsymbol{F}_{2} & -\boldsymbol{D}_{2} \boldsymbol{F}_{2} \end{array}\right] .`	$$\boldsymbol{F}_{4} \boldsymbol{P}_{4}=\left[\begin{array}{c\|c} \boldsymbol{F}_{2} & \boldsymbol{D}_{2} \boldsymbol{F}_{2} \\ \hline \boldsymbol{F}_{2} & -\boldsymbol{D}_{2} \boldsymbol{F}_{2} \end{array}\right] .$$	$$\boldsymbol{F}_{4} \boldsymbol{P}_{4}=\left[\begin{array}{c\|c} \boldsymbol{F}_{2} & \boldsymbol{D}_{2} \boldsymbol{F}_{2} \\ \hline \boldsymbol{F}_{2} & -\boldsymbol{D}_{2} \boldsymbol{F}_{2} \end{array}\right] .$$
lyche-numerical-linear-algebra_EQ0169	74	0.991	`\boldsymbol{C} \boldsymbol{A} \boldsymbol{B}=\left[ \begin{array}{cc} \lambda & \boldsymbol{a}^{T} \boldsymbol{B}_{1} \\ \mathbf{0} & \boldsymbol{C}_{1} \boldsymbol{A}_{1} \boldsymbol{B}_{1} \end{array}\right] .`	$$\boldsymbol{C} \boldsymbol{A} \boldsymbol{B}=\left[\begin{array}{cc} \lambda & \boldsymbol{a}^{T} \boldsymbol{B}_{1} \\ \mathbf{0} & \boldsymbol{C}_{1} \boldsymbol{A}_{1} \boldsymbol{B}_{1} \end{array}\right] .$$	$$\boldsymbol{C} \boldsymbol{A} \boldsymbol{B}=\left[\begin{array}{cc} \lambda & \boldsymbol{a}^{T} \boldsymbol{B}_{1} \\ \mathbf{0} & \boldsymbol{C}_{1} \boldsymbol{A}_{1} \boldsymbol{B}_{1} \end{array}\right] .$$
lyche-numerical-linear-algebra_EQ0047 (1.15)	37	0.991	`\operatorname{det}(\boldsymbol{C}(\boldsymbol{i}, \boldsymbol{j}))=\sum_{\boldsymbol{k}} \operatorname{det}(\boldsymbol{A}(\boldsymbol{i}, \boldsymbol{k})) \operatorname{det}(\boldsymbol{B}( \boldsymbol{k}, \boldsymbol{j})),`	$$\operatorname{det}(\boldsymbol{C}(\boldsymbol{i}, \boldsymbol{j}))=\sum_{\boldsymbol{k}} \operatorname{det}(\boldsymbol{A}(\boldsymbol{i}, \boldsymbol{k})) \operatorname{det}(\boldsymbol{B}(\boldsymbol{k}, \boldsymbol{j})),$$	$$\operatorname{det}\big(\boldsymbol{C}(\boldsymbol{i}, \boldsymbol{j})\big)=\sum_{\boldsymbol{k}} \operatorname{det}\big(\boldsymbol{A}(\boldsymbol{i}, \boldsymbol{k})\big) \operatorname{det}\big(\boldsymbol{B}(\boldsymbol{k}, \boldsymbol{j})\big),$$
lyche-numerical-linear-algebra_EQ0422	170	0.992	`\begin{aligned} \boldsymbol{U} \boldsymbol{\Sigma} & =\boldsymbol{U}\left[\sigma_{1} \boldsymbol{e}_{1}, \ldots, \sigma_{r} \boldsymbol{e}_{r}, 0, \ldots, 0 \right] \\ & =\left[\sigma_{1} \boldsymbol{u}_{1}, \ldots, \sigma_{r} \boldsymbol{u}_{r}, 0, \ldots, 0 \right] \\ & =\left[\boldsymbol{A} \boldsymbol{v}_{1}, \ldots, \boldsymbol{A} \boldsymbol{v}_{n}\right] . \end{aligned}`	$$\begin{aligned} \boldsymbol{U} \boldsymbol{\Sigma} & =\boldsymbol{U}\left[\sigma_{1} \boldsymbol{e}_{1}, \ldots, \sigma_{r} \boldsymbol{e}_{r}, 0, \ldots, 0\right] \\ & =\left[\sigma_{1} \boldsymbol{u}_{1}, \ldots, \sigma_{r} \boldsymbol{u}_{r}, 0, \ldots, 0\right] \\ & =\left[\boldsymbol{A} \boldsymbol{v}_{1}, \ldots, \boldsymbol{A} \boldsymbol{v}_{n}\right] . \end{aligned}$$	$$\begin{aligned} \boldsymbol{U} \boldsymbol{\Sigma} & =\boldsymbol{U}\left[\sigma_{1} \boldsymbol{e}_{1}, \ldots, \sigma_{r} \boldsymbol{e}_{r}, 0, \ldots, 0\right] \\ & =\left[\sigma_{1} \boldsymbol{u}_{1}, \ldots, \sigma_{r} \boldsymbol{u}_{r}, 0, \ldots, 0\right] \\ & =\left[\boldsymbol{A} \boldsymbol{v}_{1}, \ldots, \boldsymbol{A} \boldsymbol{v}_{n}\right] . \end{aligned}$$

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lyche-numerical-linear-algebra_EQ0702	252	0.992	\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}=h^{2} \boldsymbol{F} \quad \text { with } \quad h=1 /(m+1),	$\boldsymbol{T}\boldsymbol{V}+\boldsymbol{V}\boldsymbol{T}=h^{2} \boldsymbol{F} \quad \text { with } \quad h=1 /(m+1),$	$\boldsymbol{T}\boldsymbol{V}+\boldsymbol{V}\boldsymbol{T}=h^{2} \boldsymbol{F} \quad \text { with } \quad h=1 /(m+1),$
lyche-numerical-linear-algebra_EQ0857 (13.19)	299	0.992	\frac{\left|\boldsymbol{x}-\boldsymbol{x}_{k}\right|_{ \boldsymbol{A}}}{\left|\boldsymbol{x}-\boldsymbol{x}_{0} \right|_{\boldsymbol{A}}} \leq\left(\frac{\kappa-1}{ \kappa+1}\right)^{k}<e^{-\frac{2}{\kappa} k}, \quad, k>0,	$\frac{\left\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\|_{ \boldsymbol{A}}}{\left\|\boldsymbol{x}-\boldsymbol{x}_{0} \right\|_{\boldsymbol{A}}} \leq\left(\frac{\kappa-1}{ \kappa+1}\right)^{k}<e^{-\frac{2}{\kappa} k}, \quad, k>0,$	$\frac{\left\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\|_{ \boldsymbol{A}}}{\left\|\boldsymbol{x}-\boldsymbol{x}_{0} \right\|_{\boldsymbol{A}}} \leq\left(\frac{\kappa-1}{ \kappa+1}\right)^{k}<e^{-\frac{2}{\kappa} k}, \quad, k>0,$
lyche-numerical-linear-algebra_EQ0687 (4h)	246	0.992	\left(\boldsymbol{s}_{j} \otimes \boldsymbol{s}_{k} \right)^{T}\left(\boldsymbol{s}_{p} \otimes \boldsymbol{s}_{q}\right)=\left(\boldsymbol{s}_{j}^{T} \otimes \boldsymbol{s}_{k}^{T}\right)\left(\boldsymbol{s}_{p} \otimes \boldsymbol{s}_{q}\right)= \left(\boldsymbol{s}_{j}^{T} \boldsymbol{s}_{p}\right) \otimes\left(\boldsymbol{s}_{k}^{T} \boldsymbol{s}_{q} \right)=\frac{1}{4 h^{2}} \delta_{j, p} \delta_{k, q}	$\left(\boldsymbol{s}_{j} \otimes \boldsymbol{s}_{k}\right)^{T}\left(\boldsymbol{s}_{p} \otimes \boldsymbol{s}_{q}\right)=\left(\boldsymbol{s}_{j}^{T} \otimes \boldsymbol{s}_{k}^{T}\right)\left(\boldsymbol{s}_{p} \otimes \boldsymbol{s}_{q}\right)=\left(\boldsymbol{s}_{j}^{T} \boldsymbol{s}_{p}\right) \otimes\left(\boldsymbol{s}_{k}^{T} \boldsymbol{s}_{q} \right)=\frac{1}{4 h^{2}} \delta_{j, p} \delta_{k, q}$	$\left(\boldsymbol{s}_{j} \otimes \boldsymbol{s}_{k}\right)^{T}\left(\boldsymbol{s}_{p} \otimes \boldsymbol{s}_{q}\right)=\left(\boldsymbol{s}_{j}^{T} \otimes \boldsymbol{s}_{k}^{T}\right)\left(\boldsymbol{s}_{p} \otimes \boldsymbol{s}_{q}\right)=\left(\boldsymbol{s}_{j}^{T} \boldsymbol{s}_{p}\right) \otimes\left(\boldsymbol{s}_{k}^{T} \boldsymbol{s}_{q} \right)=\frac{1}{4 h^{2}} \delta_{j, p} \delta_{k, q}$
lyche-numerical-linear-algebra_EQ0775 (12.20)	274	0.992	\left|\boldsymbol{x}_{k}-\boldsymbol{x}\right|_{2} \leq\left(\frac{\kappa-1}{\kappa+1}\right)^{k}\left| \boldsymbol{x}_{0}-\boldsymbol{x}\right|_{2}, \quad k=0,1,2, \ldots	$\left\|\boldsymbol{x}_{k}-\boldsymbol{x}\right\|_{2} \leq\left(\frac{\kappa-1}{\kappa+1}\right)^{k}\left\| \boldsymbol{x}_{0}-\boldsymbol{x}\right\|_{2}, \quad k=0,1,2, \ldots$	$\left\|\boldsymbol{x}_{k}-\boldsymbol{x}\right\|_{2} \leq\left(\frac{\kappa-1}{\kappa+1}\right)^{k}\left\| \boldsymbol{x}_{0}-\boldsymbol{x}\right\|_{2}, \quad k=0,1,2, \ldots$
lyche-numerical-linear-algebra_EQ0904	309	0.992	\boldsymbol{\epsilon}_{j}=\boldsymbol{x}_{m+1}- \boldsymbol{x}_{j}=\boldsymbol{x}_{m}-\boldsymbol{x}_{j}+ \alpha_{m} \boldsymbol{p}_{m}=\boldsymbol{x}_{m-1}- \boldsymbol{x}_{j}+\alpha_{m-1} \boldsymbol{p}_{m-1}+ \alpha_{m} \boldsymbol{p}_{m}=\ldots	$\boldsymbol{\epsilon}_{j}=\boldsymbol{x}_{m+1}-\boldsymbol{x}_{j}=\boldsymbol{x}_{m}-\boldsymbol{x}_{j}+\alpha_{m} \boldsymbol{p}_{m}=\boldsymbol{x}_{m-1}-\boldsymbol{x}_{j}+\alpha_{m-1} \boldsymbol{p}_{m-1}+\alpha_{m} \boldsymbol{p}_{m}=\ldots$	$\boldsymbol{\epsilon}_{j}=\boldsymbol{x}_{m+1}-\boldsymbol{x}_{j}=\boldsymbol{x}_{m}-\boldsymbol{x}_{j}+\alpha_{m} \boldsymbol{p}_{m}=\boldsymbol{x}_{m-1}-\boldsymbol{x}_{j}+\alpha_{m-1} \boldsymbol{p}_{m-1}+\alpha_{m} \boldsymbol{p}_{m}=\ldots$
lyche-numerical-linear-algebra_EQ0462	183	0.992	\boldsymbol{A}=\left[\begin{array}{cc} 3 & 1 \\ 2 & 3 \\ -1 & 5 \end{array}\right] .	$\boldsymbol{A}=\left[\begin{array}{cc} 3 & 1 \\ 2 & 3 \\ -1 & 5 \end{array}\right] .$	$\boldsymbol{A}=\left[\begin{array}{cc} 3 & 1 \\ 2 & 3 \\ -1 & 5 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0015 (1.3)	26	0.993	c_{1} \boldsymbol{x}_{1}+\cdots+c_{n} \boldsymbol{x}_{n}= \mathbf{0} \quad \Longrightarrow \quad c_{1}= \cdots=c_{n}=0 .	$c_{1} \boldsymbol{x}_{1}+\cdots+c_{n} \boldsymbol{x}_{n}= \mathbf{0} \quad \Longrightarrow \quad c_{1}= \cdots=c_{n}=0 .$	$c_{1} \boldsymbol{x}_{1}+\cdots+c_{n} \boldsymbol{x}_{n}= \mathbf{0} \quad \Longrightarrow \quad c_{1}= \cdots=c_{n}=0 .$
lyche-numerical-linear-algebra_EQ0248 (4.3)	101	0.993	\begin{aligned} \boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{[n-1]} & \boldsymbol{a}_{n} \\ \boldsymbol{a}_{n}^{*} & a_{n n} \end{array}\right] & = \left[\begin{array}{cc} \boldsymbol{L}_{n-1} & \mathbf{0} \\ \boldsymbol{l}_{n}^{*} & 1 \end{array}\right]\left[\begin{array}{cc} \boldsymbol{D}_{n-1} & \mathbf{0} \\ 0 & d_{n n} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{L}_{n-1}^{*} & \boldsymbol{l}_{n} \\ \mathbf{0}^{*} & 1 \end{array}\right] \\ & = \left[\begin{array}{cc} \boldsymbol{L}_{n-1} \boldsymbol{D}_{n-1} \boldsymbol{L}_{n-1}^{*} & \boldsymbol{L}_{n-1} \boldsymbol{D}_{n-1} \boldsymbol{l}_{n} \\ \boldsymbol{l}_{n}^{*} \boldsymbol{D}_{n-1} \boldsymbol{L}_{n-1}^{*} & \boldsymbol{l}_{n}^{*} \boldsymbol{D}_{n-1} \boldsymbol{l}_{n}+d_{n n} \end{array}\right] \end{aligned}	$\begin{aligned} \boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{[n-1]} & \boldsymbol{a}_{n} \\ \boldsymbol{a}_{n}^{*} & a_{n n} \end{array}\right] & = \left[\begin{array}{cc} \boldsymbol{L}_{n-1} & \mathbf{0} \\ \boldsymbol{l}_{n}^{*} & 1 \end{array}\right]\left[\begin{array}{cc} \boldsymbol{D}_{n-1} & \mathbf{0} \\ 0 & d_{n n} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{L}_{n-1}^{*} & \boldsymbol{l}_{n} \\ \mathbf{0}^{*} & 1 \end{array}\right] \\ & = \left[\begin{array}{cc} \boldsymbol{L}_{n-1} \boldsymbol{D}_{n-1} \boldsymbol{L}_{n-1}^{*} & \boldsymbol{L}_{n-1} \boldsymbol{D}_{n-1} \boldsymbol{l}_{n} \\ \boldsymbol{l}_{n}^{*} \boldsymbol{D}_{n-1} \boldsymbol{L}_{n-1}^{*} & \boldsymbol{l}_{n}^{*} \boldsymbol{D}_{n-1} \boldsymbol{l}_{n}+d_{n n} \end{array}\right] \end{aligned}$	$\begin{aligned} \boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{[n-1]} & \boldsymbol{a}_{n} \\ \boldsymbol{a}_{n}^{*} & a_{n n} \end{array}\right] & = \left[\begin{array}{cc} \boldsymbol{L}_{n-1} & \mathbf{0} \\ \boldsymbol{l}_{n}^{*} & 1 \end{array}\right]\left[\begin{array}{cc} \boldsymbol{D}_{n-1} & \mathbf{0} \\ 0 & d_{n n} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{L}_{n-1}^{*} & \boldsymbol{l}_{n} \\ \mathbf{0}^{*} & 1 \end{array}\right] \\ & = \left[\begin{array}{cc} \boldsymbol{L}_{n-1} \boldsymbol{D}_{n-1} \boldsymbol{L}_{n-1}^{*} & \boldsymbol{L}_{n-1} \boldsymbol{D}_{n-1} \boldsymbol{l}_{n} \\ \boldsymbol{l}_{n}^{*} \boldsymbol{D}_{n-1} \boldsymbol{L}_{n-1}^{*} & \boldsymbol{l}_{n}^{*} \boldsymbol{D}_{n-1} \boldsymbol{l}_{n}+d_{n n} \end{array}\right] \end{aligned}$

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lyche-numerical-linear-algebra_EQ0583	216	0.993	`\boldsymbol{A} \boldsymbol{x}=\left[\begin{array}{c} \boldsymbol{u}_{1}^{*} \\ \boldsymbol{u}_{2}^{*} \\ \vdots \\ \boldsymbol{u}_{m}^{*} \end{array}\right] \boldsymbol{x}=\left[\begin{array}{c} y_{1} \\ y_{2} \\ \vdots \\ y_{m} \end{array}\right]=\boldsymbol{b} .`	$\boldsymbol{A}\boldsymbol{x}=\left[\begin{array}{c} \boldsymbol{u}_{1}^{*} \\ \boldsymbol{u}_{2}^{*} \\ \vdots \\ \boldsymbol{u}_{m}^{*} \end{array}\right] \boldsymbol{x}=\left[\begin{array}{c} y_{1} \\ y_{2} \\ \vdots \\ y_{m} \end{array}\right]=\boldsymbol{b} .$	$\boldsymbol{A}\boldsymbol{x}=\left[\begin{array}{c} \boldsymbol{u}_{1}^{*} \\ \boldsymbol{u}_{2}^{*} \\ \vdots \\ \boldsymbol{u}_{m}^{*} \end{array}\right] \boldsymbol{x}=\left[\begin{array}{c} y_{1} \\ y_{2} \\ \vdots \\ y_{m} \end{array}\right]=\boldsymbol{b} .$
lyche-numerical-linear-algebra_EQ0432	173	0.993	`\boldsymbol{\Sigma}=\left[\begin{array}{cc} \boldsymbol{\Sigma}_{1} & 0 \\ 0 & 0 \\ 0 & 0 \end{array}\right], \quad \boldsymbol{\Sigma}_{1}=[2], \quad \boldsymbol{V}=\frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & 1 \\ 1 & -1 \end{array}\right] .`	$\boldsymbol{\Sigma}=\left[\begin{array}{cc} \boldsymbol{\Sigma}_{1} & 0 \\ 0 & 0 \\ 0 & 0 \end{array}\right], \quad \boldsymbol{\Sigma}_{1}=[2], \quad \boldsymbol{V}=\frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & 1 \\ 1 & -1 \end{array}\right] .$	$\boldsymbol{\Sigma}=\left[\begin{array}{cc} \boldsymbol{\Sigma}_{1} & 0 \\ 0 & 0 \\ 0 & 0 \end{array}\right], \quad \boldsymbol{\Sigma}_{1}=[2], \quad \boldsymbol{V}=\frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & 1 \\ 1 & -1 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0769	273	0.993	`\left|\boldsymbol{x}_{k}-\boldsymbol{x}\right|=\left|\boldsymbol{G}^{k}\left(\boldsymbol{x}_{0}-\boldsymbol{x}\right)\right| \leq\left|\boldsymbol{G}^{k}\right|\left|\boldsymbol{x}_{0}-\boldsymbol{x}\right| \leq|\boldsymbol{G}|^{k}\left|\boldsymbol{x}_{0}-\boldsymbol{x}\right| \rightarrow \mathbf{0}, \quad k \rightarrow \infty .`	$\left\|\boldsymbol{x}_{k}-\boldsymbol{x}\right\|=\left\|\boldsymbol{G}^{k}\left(\boldsymbol{x}_{0}-\boldsymbol{x}\right)\right\| \leq\left\|\boldsymbol{G}^{k}\right\|\left\|\boldsymbol{x}_{0}-\boldsymbol{x}\right\| \leq\|\boldsymbol{G}\|^{k}\left\|\boldsymbol{x}_{0}-\boldsymbol{x}\right\| \rightarrow \mathbf{0}, \quad k \rightarrow \infty .$	$\left\|\boldsymbol{x}_{k}-\boldsymbol{x}\right\|=\left\|\boldsymbol{G}^{k}\left(\boldsymbol{x}_{0}-\boldsymbol{x}\right)\right\| \leq\left\|\boldsymbol{G}^{k}\right\|\left\|\boldsymbol{x}_{0}-\boldsymbol{x}\right\| \leq\|\boldsymbol{G}\|^{k}\left\|\boldsymbol{x}_{0}-\boldsymbol{x}\right\| \rightarrow \mathbf{0}, \quad k \rightarrow \infty .$
lyche-numerical-linear-algebra_EQ0863	300	0.993	`\mathbb{W}_{k}=\operatorname{span}\left( \boldsymbol{r}_{0}, \boldsymbol{A} \boldsymbol{r}_{0}, \boldsymbol{A}^{2} \boldsymbol{r}_{0}, \ldots, \boldsymbol{A}^{k-1} \boldsymbol{r}_{0}\right), \quad k=1,2,3, \cdots .`	$\mathbb{W}_{k}=\operatorname{span}\left(\boldsymbol{r}_{0}, \boldsymbol{A} \boldsymbol{r}_{0}, \boldsymbol{A}^{2} \boldsymbol{r}_{0}, \ldots, \boldsymbol{A}^{k-1} \boldsymbol{r}_{0}\right), \quad k=1,2,3, \cdots .$	$\mathbb{W}_{k}=\operatorname{span}\left(\boldsymbol{r}_{0}, \boldsymbol{A} \boldsymbol{r}_{0}, \boldsymbol{A}^{2} \boldsymbol{r}_{0}, \ldots, \boldsymbol{A}^{k-1} \boldsymbol{r}_{0}\right), \quad k=1,2,3, \cdots .$
lyche-numerical-linear-algebra_EQ0279	117	0.993	`\langle\boldsymbol{x}, \boldsymbol{y}\rangle:= \boldsymbol{y}^{*} \boldsymbol{x}=\boldsymbol{x}^{T} \overline{\boldsymbol{y}}=\sum_{j=1}^{n} x_{j} \overline{y_{j}} .`	$\langle\boldsymbol{x}, \boldsymbol{y}\rangle:= \boldsymbol{y}^{*} \boldsymbol{x}=\boldsymbol{x}^{T} \overline{\boldsymbol{y}}=\sum_{j=1}^{n} x_{j} \overline{y_{j}} .$	$\langle\boldsymbol{x}, \boldsymbol{y}\rangle:= \boldsymbol{y}^{*} \boldsymbol{x}=\boldsymbol{x}^{T} \overline{\boldsymbol{y}}=\sum_{j=1}^{n} x_{j} \overline{y_{j}} .$
lyche-numerical-linear-algebra_EQ0414	165	0.994	`R(x):=\frac{x^{T} A x}{x^{T} x} .`	$R(x):=\frac{x^{T} A x}{x^{T} x} .$	$R(x):=\frac{x^{T} A x}{x^{T} x} .$
lyche-numerical-linear-algebra_EQ0802	281	0.994	`\begin{aligned} \\|\boldsymbol{A}\\| & =\left| \boldsymbol{D}_{t} \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U} \boldsymbol{D}_{t}^{-1}\right \\|_{1}=\left|\boldsymbol{D}_{t} \boldsymbol{R} \boldsymbol{D}_{t}^{-1}\right|_{1}=\max _{1 \leq j \leq n} \sum_{i=1}^{n}\left|\left(\boldsymbol{D}_{t} \boldsymbol{R} \boldsymbol{D}_{t}^{-1}\right)_{i j} \right| \\ & \leq \max _{1 \leq j \leq n}(\left|\lambda_{j}\right|+\epsilon)=\rho(\boldsymbol{A})+\epsilon . \end{aligned}`	$\begin{aligned} \\|\boldsymbol{A}\\| & =\left\| \boldsymbol{D}_{t} \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U} \boldsymbol{D}_{t}^{-1}\right \\|_{1}=\left\|\boldsymbol{D}_{t} \boldsymbol{R} \boldsymbol{D}_{t}^{-1}\right\|_{1}=\max _{1 \leq j \leq n} \sum_{i=1}^{n}\left\|\left(\boldsymbol{D}_{t} \boldsymbol{R} \boldsymbol{D}_{t}^{-1}\right)_{i j} \right\| \\ & \leq \max _{1 \leq j \leq n}(\left\|\lambda_{j}\right\|+\epsilon)=\rho(\boldsymbol{A})+\epsilon . \end{aligned}$	$\begin{aligned} \\|\boldsymbol{A}\\| & =\left\| \boldsymbol{D}_{t} \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U} \boldsymbol{D}_{t}^{-1}\right \\|_{1}=\left\|\boldsymbol{D}_{t} \boldsymbol{R} \boldsymbol{D}_{t}^{-1}\right\|_{1}=\max _{1 \leq j \leq n} \sum_{i=1}^{n}\left\|\left(\boldsymbol{D}_{t} \boldsymbol{R} \boldsymbol{D}_{t}^{-1}\right)_{i j} \right\| \\ & \leq \max _{1 \leq j \leq n}(\left\|\lambda_{j}\right\|+\epsilon)=\rho(\boldsymbol{A})+\epsilon . \end{aligned}$

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lyche-numerical-linear-algebra_EQ0175 (3.1)	77	0.994	`\boldsymbol{A}^{(k)}=\left[\begin{array}{ccc|ccccc} a_{1,1}^{(1)} & \cdots & a_{1, k-1}^{(1)} & a_{1, k}^{(1)} & \cdots & a_{1, j}^{(1)} & \cdots & a_{1, n}^{(1)} \\ & \ddots & \vdots & \vdots & & \vdots & & \vdots \\ & & a_{k-1, k-1}^{(k-1)} & a_{k-1, k}^{(k-1)} & \cdots & a_{k-1, j}^{(k-1)} & \cdots & a_{k-1, n}^{(k-1)} \\ \hline & & & a_{k, k}^{(k)} & \cdots & a_{k, j}^{(k)} & \cdots & a_{k, n}^{(k)} \\ & & & \vdots & & \vdots & & \vdots \\ & & & a_{i, k}^{(k)} & \cdots & a_{i, j}^{(k)} & \cdots & a_{i, n}^{(k)} \\ & & & \vdots & & \vdots & & \vdots \\ & & & a_{n, k}^{(k)} & \cdots & a_{n, j}^{(k)} & \cdots & a_{n, n}^{(k)} \end{array}\right] .`	$\boldsymbol{A}^{(k)}=\left[\begin{array}{ccc\|ccccc} a_{1,1}^{(1)} & \cdots & a_{1,k-1}^{(1)} & a_{1,k}^{(1)} & \cdots & a_{1,j}^{(1)} & \cdots & a_{1,n}^{(1)} \\ & \ddots & \vdots & \vdots & & \vdots & & \vdots \\ & & a_{k-1,k-1}^{(k-1)} & a_{k-1,k}^{(k-1)} & \cdots & a_{k-1,j}^{(k-1)} & \cdots & a_{k-1,n}^{(k-1)} \\ \hline & & & a_{k,k}^{(k)} & \cdots & a_{k,j}^{(k)} & \cdots & a_{k,n}^{(k)} \\ & & & \vdots & & \vdots & & \vdots \\ & & & a_{i,k}^{(k)} & \cdots & a_{i,j}^{(k)} & \cdots & a_{i,n}^{(k)} \\ & & & \vdots & & \vdots & & \vdots \\ & & & a_{n,k}^{(k)} & \cdots & a_{n,j}^{(k)} & \cdots & a_{n,n}^{(k)} \end{array}\right] .$	$\boldsymbol{A}^{(k)}=\left[\begin{array}{ccc\|ccccc} a_{1,1}^{(1)} & \cdots & a_{1,k-1}^{(1)} & a_{1,k}^{(1)} & \cdots & a_{1,j}^{(1)} & \cdots & a_{1,n}^{(1)} \\ & \ddots & \vdots & \vdots & & \vdots & & \vdots \\ & & a_{k-1,k-1}^{(k-1)} & a_{k-1,k}^{(k-1)} & \cdots & a_{k-1,j}^{(k-1)} & \cdots & a_{k-1,n}^{(k-1)} \\ \hline & & & a_{k,k}^{(k)} & \cdots & a_{k,j}^{(k)} & \cdots & a_{k,n}^{(k)} \\ & & & \vdots & & \vdots & & \vdots \\ & & & a_{i,k}^{(k)} & \cdots & a_{i,j}^{(k)} & \cdots & a_{i,n}^{(k)} \\ & & & \vdots & & \vdots & & \vdots \\ & & & a_{n,k}^{(k)} & \cdots & a_{n,j}^{(k)} & \cdots & a_{n,n}^{(k)} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0833	288	0.994	`A:=\left[\begin{array}{lll} 3 & 0 & 1 \\ 0 & 7 & 2 \\ 1 & 2 & 4 \end{array}\right]`	$A:=\left[\begin{array}{lll} 3 & 0 & 1 \\ 0 & 7 & 2 \\ 1 & 2 & 4 \end{array}\right]$	$\boldsymbol{A}:=\left[\begin{array}{lll} 3 & 0 & 1 \\ 0 & 7 & 2 \\ 1 & 2 & 4 \end{array}\right]$
lyche-numerical-linear-algebra_EQ0992	335	0.994	`\boldsymbol{Q}_{n-1}=\boldsymbol{I} \text { and } \boldsymbol{Q}_{k}=\boldsymbol{H}_{k} \boldsymbol{Q}_{k+1} \text { for } k=n-2, n-3, \ldots, 1 .`	$\boldsymbol{Q}_{n-1}=\boldsymbol{I} \text { and } \boldsymbol{Q}_{k}=\boldsymbol{H}_{k} \boldsymbol{Q}_{k+1} \text { for } k=n-2, n-3, \ldots, 1 .$	$\boldsymbol{Q}_{n-1}=\boldsymbol{I} \text { and } \boldsymbol{Q}_{k}=\boldsymbol{H}_{k} \boldsymbol{Q}_{k+1} \text { for } k=n-2, n-3, \ldots, 1 .$
lyche-numerical-linear-algebra_EQ1019 (15.2)	345	0.994	`\begin{aligned} & \text { (i) }\left|\lambda_{1}\right|> \left|\lambda_{2}\right| \geq\left|\lambda_{3}\right| \geq \cdots \geq \cdots \geq\left|\lambda_{n}\right| \text {, } \\ & \text { (ii) } z_{0}^{T} v_{1} \neq 0 \end{aligned}`	$\begin{aligned} & \text { (i) }\left\|\lambda_{1}\right\|>\left\|\lambda_{2}\right\| \geq\left\|\lambda_{3}\right\| \geq \cdots \geq \cdots \geq\left\|\lambda_{n}\right\| \text {, } \\ & \text { (ii) } z_{0}^{T} v_{1} \neq 0 \end{aligned}$	$\begin{aligned} & (i) \quad\left\|\lambda_{1}\right\|>\left\|\lambda_{2}\right\| \geq\left\|\lambda_{3}\right\| \geq \cdots \geq \cdots \geq\left\|\lambda_{n}\right\|, \\ & (ii) \quad z_{0}^{T} \boldsymbol{v}_{1} \neq 0 \end{aligned}$
lyche-numerical-linear-algebra_EQ0124	61	0.995	`\begin{aligned} \left(\boldsymbol{T}_{1} \boldsymbol{s}_{j}\right)_{k} & =\sum_{l=1}^{m} t_{k, l} \sin (l j \pi h) \\ & =a[\sin ((k-1) j \pi h)+\sin ((k+1) j \pi h)]+d \sin (k j \pi h) \\ & =2 a \cos (j \pi h) \sin (k j \pi h)+d \sin (k j \pi h)=\lambda_{j} s_{k, j} . \end{aligned}`	$\begin{aligned} \left(\boldsymbol{T}_{1} \boldsymbol{s}_{j}\right)_{k} & =\sum_{l=1}^{m} t_{k, l} \sin (l j \pi h) \\ & =a[\sin ((k-1) j \pi h)+\sin ((k+1) j \pi h)]+d \sin (k j \pi h) \\ & =2 a \cos (j \pi h) \sin (k j \pi h)+d \sin (k j \pi h)=\lambda_{j} s_{k, j} . \end{aligned}$	$\begin{aligned} \left(\boldsymbol{T}_{1} \boldsymbol{s}_{j}\right)_{k} & =\sum_{l=1}^{m} t_{k, l} \sin (l j \pi h) \\ & =a\left[\sin \left((k-1) j \pi h\right)+\sin \left((k+1) j \pi h\right)\right]+d \sin (k j \pi h) \\ & =2 a \cos (j \pi h) \sin (k j \pi h)+d \sin (k j \pi h)=\lambda_{j} s_{k, j} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0384 (6.9)	155	0.995	`R_{\boldsymbol{A}}(\boldsymbol{x})=\frac{\sum_{i=1}^{n} \lambda_{i}\left|c_{i}\right|^{2}}{\sum_{j=1}^{n} \left|c_{j}\right|^{2}}, \quad \boldsymbol{x} \neq \mathbf{0}, \quad \boldsymbol{x}=\sum_{j=1}^{n} c_{j} \boldsymbol{u}_{j} .`	$R_{\boldsymbol{A}}(\boldsymbol{x})=\frac{\sum_{i=1}^{n} \lambda_{i}\left\|c_{i}\right\|^{2}}{\sum_{j=1}^{n} \left\|c_{j}\right\|^{2}}, \quad \boldsymbol{x} \neq \mathbf{0}, \quad \boldsymbol{x}=\sum_{j=1}^{n} c_{j} \boldsymbol{u}_{j} .$	$R_{\boldsymbol{A}}(\boldsymbol{x})=\frac{\sum_{i=1}^{n} \lambda_{i}\left\|c_{i}\right\|^{2}}{\sum_{j=1}^{n} \left\|c_{j}\right\|^{2}}, \quad \boldsymbol{x} \neq \mathbf{0}, \quad \boldsymbol{x}=\sum_{j=1}^{n} c_{j} \boldsymbol{u}_{j} .$

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lyche-numerical-linear-algebra_EQ0632	229	0.995	`\begin{gathered} \lambda_{1} \geq \cdots \geq \lambda_{m+n}=\alpha_{1} \geq \cdots \geq \alpha_{t} \geq 0=\cdots=0 \geq-\alpha_{t} \geq \cdots \geq-\alpha_{1}, \\ \mu_{1} \geq \cdots \geq \mu_{m+n}=\beta_{1} \geq \cdots \geq \beta_{t} \geq 0=\cdots=0 \geq-\beta_{t} \geq \cdots \geq-\beta_{1} . \end{gathered}`	$\lambda_1 \geq \cdots \geq \lambda_{m+n} = \alpha_1 \geq \cdots \geq \alpha_t \geq 0 = \cdots = 0 \geq -\alpha_t \geq \cdots \geq -\alpha_1,$ $\mu_1 \geq \cdots \geq \mu_{m+n} = \beta_1 \geq \cdots \geq \beta_t \geq 0 = \cdots = 0 \geq -\beta_t \geq \cdots \geq -\beta_1.$	$\lambda_1 \geq \cdots \geq \lambda_{m+n} = \alpha_1 \geq \cdots \geq \alpha_t \geq 0 = \cdots = 0 \geq -\alpha_t \geq \cdots \geq -\alpha_1,$ $\mu_1 \geq \cdots \geq \mu_{m+n} = \beta_1 \geq \cdots \geq \beta_t \geq 0 = \cdots = 0 \geq -\beta_t \geq \cdots \geq -\beta_1.$
lyche-numerical-linear-algebra_EQ0647	233	0.995	`\boldsymbol{A}^{\dagger}=\frac{1}{\alpha} \boldsymbol{A}^{*}, \quad \alpha=\\|\boldsymbol{u} \\|_{2}^{2}\\|\boldsymbol{v}\\|_{2}^{2} .`	$\boldsymbol{A}^{\dagger} = \frac{1}{\alpha}\boldsymbol{A}^{*}, \quad \alpha = \\|\boldsymbol{u}\\|_2^2 \\|\boldsymbol{v}\\|_2^2.$	$\boldsymbol{A}^{\dagger} = \frac{1}{\alpha}\boldsymbol{A}^{*}, \quad \alpha = \\|\boldsymbol{u}\\|_2^2 \\|\boldsymbol{v}\\|_2^2.$
lyche-numerical-linear-algebra_EQ0881 (13.31)	304	0.995	`x_{n+1}-2 t x_{n}+x_{n-1}=0 \text { for } n \geq 1, \text { with } x_{0}=1, x_{1}=t .`	$x_{n+1} - 2tx_n + x_{n-1} = 0 \text{ for } n \geq 1, \text{ with } x_0 = 1, x_1 = t.$	$x_{n+1} - 2tx_n + x_{n-1} = 0 \text{ for } n \geq 1, \text{ with } x_0 = 1, x_1 = t.$
lyche-numerical-linear-algebra_EQ0301	124	0.995	`\left(\boldsymbol{U}^{*} \boldsymbol{U}\right)_{i, j}=\boldsymbol{e}_{i}^{*} \boldsymbol{U}^{*} \boldsymbol{U} \boldsymbol{e}_{j}=\left(\boldsymbol{U} \boldsymbol{e}_{i}\right)^{*}\left(\boldsymbol{U} \boldsymbol{e}_{j}\right)=\left\langle\boldsymbol{U} \boldsymbol{e}_{j}, \boldsymbol{U} \boldsymbol{e}_{i} \right\rangle=\left\langle\boldsymbol{e}_{j}, \boldsymbol{e}_{i}\right\rangle=\boldsymbol{e}_{i}^{*} \boldsymbol{e}_{j},`	$(\boldsymbol{U}^*\boldsymbol{U})_{i,j} = \boldsymbol{e}_i^*\boldsymbol{U}^*\boldsymbol{U}\boldsymbol{e}_j = (\boldsymbol{U}\boldsymbol{e}_i)^*(\boldsymbol{U}\boldsymbol{e}_j) = \langle \boldsymbol{U}\boldsymbol{e}_j, \boldsymbol{U}\boldsymbol{e}_i\rangle = \langle \boldsymbol{e}_j, \boldsymbol{e}_i\rangle = \boldsymbol{e}_i^*\boldsymbol{e}_j,$	$(\boldsymbol{U}^*\boldsymbol{U})_{i,j} = \boldsymbol{e}_i^*\boldsymbol{U}^*\boldsymbol{U}\boldsymbol{e}_j = (\boldsymbol{U}\boldsymbol{e}_i)^*(\boldsymbol{U}\boldsymbol{e}_j) = \langle \boldsymbol{U}\boldsymbol{e}_j, \boldsymbol{U}\boldsymbol{e}_i\rangle = \langle \boldsymbol{e}_j, \boldsymbol{e}_i\rangle = \boldsymbol{e}_i^*\boldsymbol{e}_j,$
lyche-numerical-linear-algebra_EQ0311	126	0.995	`\boldsymbol{H} \boldsymbol{x}=a \boldsymbol{e}_{1}, \quad a=-\rho\\|\boldsymbol{x}\\|_{2}, \quad \rho:= \begin{cases}x_{1} /\left|x_{1}\right|, & \text { if } x_{1} \neq 0, \\ 1, & \text { otherwise } .\end{cases}`	$\boldsymbol{H}\boldsymbol{x} = a\boldsymbol{e}_1, \quad a = -\rho\\|\boldsymbol{x}\\|_2, \quad \rho := \begin{cases} x_1/\|x_1\|, & \text{if } x_1 \neq 0, \\ 1, & \text{otherwise} . \end{cases}$	$\boldsymbol{H}\boldsymbol{x} = a\boldsymbol{e}_1, \quad a = -\rho\\|\boldsymbol{x}\\|_2, \quad \rho := \begin{cases} x_1/\|x_1\|, & \text{if } x_1 \neq 0, \\ 1, & \text{otherwise}. \end{cases}$
lyche-numerical-linear-algebra_EQ0013	25	0.995	`(\boldsymbol{f}+\boldsymbol{g})(t):=\boldsymbol{f}(t)+ \boldsymbol{g}(t), \quad(c \boldsymbol{f})(t):=c \boldsymbol{f}(t), \quad t \in \mathcal{D}, \quad c \in \mathbb{R} .`	$(\boldsymbol{f}+\boldsymbol{g})(t) := \boldsymbol{f}(t) + \boldsymbol{g}(t), \quad (c\boldsymbol{f})(t) := c\boldsymbol{f}(t), \quad t \in \mathcal{D}, \quad c \in \mathbb{R}.$	$(\boldsymbol{f}+\boldsymbol{g})(t) := \boldsymbol{f}(t) + \boldsymbol{g}(t), \quad (c\boldsymbol{f})(t) := c\boldsymbol{f}(t), \quad t \in \mathcal{D}, \quad c \in \mathbb{R}.$
lyche-numerical-linear-algebra_EQ0061 (1.20)	41	0.995	`\lambda:=\boldsymbol{a}^{T} \boldsymbol{C} \boldsymbol{e}_{i} \neq 0,`	$\lambda := \boldsymbol{a}^T\boldsymbol{C}\boldsymbol{e}_i \neq 0,$	$\lambda := \boldsymbol{a}^T\boldsymbol{C}\boldsymbol{e}_i \neq 0,$
lyche-numerical-linear-algebra_EQ0216	88	0.995	`x_{2}=\frac{3.9997}{1.9999} \approx 2, \quad x_{1}=3-x_{2} \approx 1 .`	$x_2 = \frac{3.9997}{1.9999} \approx 2, \quad x_1 = 3 - x_2 \approx 1.$	$x_2 = \frac{3.9997}{1.9999} \approx 2, \quad x_1 = 3 - x_2 \approx 1.$
lyche-numerical-linear-algebra_EQ0284	118	0.995	`\begin{aligned} \\|\boldsymbol{x}\\|^{2} & =\langle \boldsymbol{x}, \boldsymbol{x}\rangle=\langle \boldsymbol{z}+a \boldsymbol{y}, \boldsymbol{z}+a \boldsymbol{y}\rangle \\ & \stackrel{(5.4)}{=} \langle\boldsymbol{z}, \boldsymbol{z}\rangle+ \langle a \boldsymbol{y}, a \boldsymbol{y}\rangle \stackrel{(5.1)}{=}\\|\boldsymbol{z}\\|^{2}+|a|^{2}\\| \boldsymbol{y}\\|^{2} \\ & \geq|a|^{2}\\|\boldsymbol{y} \\|^{2}=\frac{|\langle\boldsymbol{x}, \boldsymbol{y} \rangle|^{2}}{\\|\boldsymbol{y}\\|^{2}} . \end{aligned}`	$\begin{aligned} \\|\boldsymbol{x}\\|^2 &= \langle \boldsymbol{x}, \boldsymbol{x}\rangle = \langle \boldsymbol{z} + a\boldsymbol{y}, \boldsymbol{z} + a\boldsymbol{y}\rangle \\ &\overset{(5.4)}{=} \langle \boldsymbol{z}, \boldsymbol{z}\rangle + \langle a\boldsymbol{y}, a\boldsymbol{y}\rangle \overset{(5.1)}{=} \\|\boldsymbol{z}\\|^2 + |a|^2\\|\boldsymbol{y}\\|^2 \\ &\geq |a|^2\\|\boldsymbol{y}\\|^2 = \frac{|\langle \boldsymbol{x}, \boldsymbol{y}\rangle|^2}{\\|\boldsymbol{y}\\|^2}. \end{aligned}$	$\begin{aligned} \\|\boldsymbol{x}\\|^2 &= \langle \boldsymbol{x}, \boldsymbol{x}\rangle = \langle \boldsymbol{z} + a\boldsymbol{y}, \boldsymbol{z} + a\boldsymbol{y}\rangle \\ &\overset{(5.4)}{=} \langle \boldsymbol{z}, \boldsymbol{z}\rangle + \langle a\boldsymbol{y}, a\boldsymbol{y}\rangle \overset{(5.1)}{=} \\|\boldsymbol{z}\\|^2 + |a|^2\\|\boldsymbol{y}\\|^2 \\ &\geq |a|^2\\|\boldsymbol{y}\\|^2 = \frac{|\langle \boldsymbol{x}, \boldsymbol{y}\rangle|^2}{\\|\boldsymbol{y}\\|^2}. \end{aligned}$
lyche-numerical-linear-algebra_EQ0374	152	0.995	`\boldsymbol{W}=\left[\begin{array}{c|c} 1 & \mathbf{0}^{*} \\ \hline \mathbf{0} & \boldsymbol{W}_{1} \end{array}\right] \text { and } \boldsymbol{U}= \boldsymbol{V} \boldsymbol{W} .`	$\boldsymbol{W} = \left[\begin{array}{c\|c} 1 & \mathbf{0}^* \\ \hline \mathbf{0} & \boldsymbol{W}_1 \end{array}\right] \text{ and } \boldsymbol{U} = \boldsymbol{V}\boldsymbol{W}.$	$\boldsymbol{W} = \left[\begin{array}{c\|c} 1 & \mathbf{0}^* \\ \hline \mathbf{0} & \boldsymbol{W}_1 \end{array}\right] \text{ and } \boldsymbol{U} = \boldsymbol{V}\boldsymbol{W}.$

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lyche-numerical-linear-algebra_EQ0858 (13.20)	299	0.995	`\frac{\left|\boldsymbol{x}-\boldsymbol{x}_{k}\right|_{ \boldsymbol{A}}}{\left|\boldsymbol{x}-\boldsymbol{x}_{0} \right|_{\boldsymbol{A}}} \leq 2\left(\frac{\sqrt{ \kappa}-1}{\sqrt{\kappa}+1}\right)^{k}<2 e^{-\frac{2}{ \sqrt{\kappa}} k}, \quad k \geq 0 .`	$\frac{\left\\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\\|_{ \boldsymbol{A}}}{\left\\|\boldsymbol{x}-\boldsymbol{x}_{0}\right\\|_{ \boldsymbol{A}}} \leq 2\left(\frac{\sqrt{ \kappa}-1}{\sqrt{\kappa}+1}\right)^{k}<2 e^{-\frac{2}{ \sqrt{\kappa}} k}, \quad k \geq 0 .$	$\frac{\|\|\boldsymbol{x}-\boldsymbol{x}_{k}\|\|_{ \boldsymbol{A}}}{\|\|\boldsymbol{x}-\boldsymbol{x}_{0}\|\|_{ \boldsymbol{A}}} \leq 2\left(\frac{\sqrt{ \kappa}-1}{\sqrt{\kappa}+1}\right)^{k}<2 e^{-\frac{2}{ \sqrt{\kappa}} k}, \quad k \geq 0 .$
lyche-numerical-linear-algebra_EQ0459	182	0.995	`\begin{aligned} & x_{1}-x_{3}=4, \\ & x_{1}+x_{2}+x_{3}=12 . \end{aligned}`	$\begin{aligned} & x_{1}-x_{3}=4, \\ & x_{1}+x_{2}+x_{3}=12 . \end{aligned}$	$\begin{aligned} & x_{1}-x_{3}=4, \\ & x_{1}+x_{2}+x_{3}=12 . \end{aligned}$
lyche-numerical-linear-algebra_EQ0982	331	0.995	`1=\\|\boldsymbol{x}\\|_{p}=\left\\|\boldsymbol{X} \boldsymbol{D}_{1}^{-1} \boldsymbol{X}^{-1} \boldsymbol{r}\right\\|_{p} \leq\left\\| \boldsymbol{D}_{1}^{-1}\right\\|_{p} K_{p}(\boldsymbol{X}) \\|\boldsymbol{r}\\|_{p}=\frac{K_{p}(\boldsymbol{X})\\| \boldsymbol{r}\\|_{p}}{\min _{j}\left|\lambda_{j}-\mu \right|} .`	$1=\\|\boldsymbol{x}\\|_{p}=\left\\|\boldsymbol{X} \boldsymbol{D}_{1}^{-1} \boldsymbol{X}^{-1} \boldsymbol{r}\right\\|_{p} \leq\left\\| \boldsymbol{D}_{1}^{-1}\right\\|_{p} K_{p}(\boldsymbol{X}) \\|\boldsymbol{r}\\|_{p}=\frac{K_{p}(\boldsymbol{X})\\| \boldsymbol{r}\\|_{p}}{\min _{j}\left\|\lambda_{j}-\mu \right\|} .$	$1=\\|\boldsymbol{x}\\|_{p}=\left\\|\boldsymbol{X} \boldsymbol{D}_{1}^{-1} \boldsymbol{X}^{-1} \boldsymbol{r}\right\\|_{p} \leq\left\\| \boldsymbol{D}_{1}^{-1}\right\\|_{p} K_{p}(\boldsymbol{X}) \\|\boldsymbol{r}\\|_{p}=\frac{K_{p}(\boldsymbol{X})\\| \boldsymbol{r}\\|_{p}}{\min _{j}\left\|\lambda_{j}-\mu \right\|} .$
lyche-numerical-linear-algebra_EQ0951 (13.63)	321	0.995	`\left|\boldsymbol{A}^{-1}\right|_{2}=\max _{ \boldsymbol{x} \neq \mathbf{0}} \frac{|\boldsymbol{x} \\|_{2}}{|\boldsymbol{A} \boldsymbol{x}\\|_{2}},`	$\left\|\boldsymbol{A}^{-1}\right\|_{2}=\max _{ \boldsymbol{x} \neq \mathbf{0}} \frac{\|\boldsymbol{x} \\|_{2}}{\|\boldsymbol{A} \boldsymbol{x}\\|_{2}},$	$\left\|\boldsymbol{A}^{-1}\right\|_{2}=\max _{ \boldsymbol{x} \neq \mathbf{0}} \frac{\|\boldsymbol{x} \\|_{2}}{\|\boldsymbol{A} \boldsymbol{x}\\|_{2}},$
lyche-numerical-linear-algebra_EQ0648	233	0.995	`\lambda_{i}^{\dagger}=\left\{\begin{array}{cc} 1 / \lambda_{i}, & \lambda_{i} \neq 0 \\ 0 & \lambda_{i}=0 . \end{array}\right.`	$\lambda_{i}^{\dagger}=\left\{\begin{array}{cc} 1 / \lambda_{i}, & \lambda_{i} \neq 0 \\ 0 & \lambda_{i}=0 . \end{array}\right.$	$\lambda_{i}^{\dagger}=\left\{\begin{array}{cc} 1 / \lambda_{i}, & \lambda_{i} \neq 0 \\ 0 & \lambda_{i}=0 . \end{array}\right.$
lyche-numerical-linear-algebra_EQ0532 (8.39)	203	0.995	`\langle n \boldsymbol{x}, \boldsymbol{y}\rangle= \langle(n-1) \boldsymbol{x}+\boldsymbol{x}, \boldsymbol{y}\rangle \stackrel{\text { (8.37) }}{=} \langle(n-1) \boldsymbol{x}, \boldsymbol{y}\rangle+ \langle\boldsymbol{x}, \boldsymbol{y}\rangle=n\langle \boldsymbol{x}, \boldsymbol{y}\rangle .`	$\langle n \boldsymbol{x}, \boldsymbol{y}\rangle= \langle(n-1) \boldsymbol{x}+\boldsymbol{x}, \boldsymbol{y}\rangle \stackrel{\text { (8.37) }}{=} \langle(n-1) \boldsymbol{x}, \boldsymbol{y}\rangle+ \langle\boldsymbol{x}, \boldsymbol{y}\rangle=n\langle \boldsymbol{x}, \boldsymbol{y}\rangle .$	$\langle n \boldsymbol{x}, \boldsymbol{y}\rangle= \langle(n-1) \boldsymbol{x}+\boldsymbol{x}, \boldsymbol{y}\rangle \stackrel{\text { (8.37) }}{=} \langle(n-1) \boldsymbol{x}, \boldsymbol{y}\rangle+ \langle\boldsymbol{x}, \boldsymbol{y}\rangle=n\langle \boldsymbol{x}, \boldsymbol{y}\rangle .$
lyche-numerical-linear-algebra_EQ0975	330	0.995	`\boldsymbol{A}_{1}:=\left[\begin{array}{cccccc} 0 & 1 & 0 & \cdots & 0 & 0 \\ 0 & 0 & 1 & \cdots & 0 & 0 \\ \vdots & \vdots & \vdots & & \vdots & \vdots \\ 0 & 0 & 0 & \cdots & 0 & 1 \\ 0 & 0 & 0 & \cdots & 0 & 0 \end{array}\right], \quad \boldsymbol{E}:=\left[\begin{array}{cccccc} 0 & 0 & 0 & \cdots & 0 & 0 \\ 0 & 0 & 0 & \cdots & 0 & 0 \\ \vdots & \vdots & \vdots & & \vdots & \vdots \\ 0 & 0 & 0 & \cdots & 0 & 0 \\ \epsilon & 0 & 0 & \cdots & 0 & 0 \end{array}\right]=\epsilon \boldsymbol{e}_{n} \boldsymbol{e}_{1}^{T} .`	$\boldsymbol{A}_{1}:=\left[\begin{array}{cccccc} 0 & 1 & 0 & \cdots & 0 & 0 \\ 0 & 0 & 1 & \cdots & 0 & 0 \\ \vdots & \vdots & \vdots & & \vdots & \vdots \\ 0 & 0 & 0 & \cdots & 0 & 1 \\ 0 & 0 & 0 & \cdots & 0 & 0 \end{array}\right], \quad \boldsymbol{E}:=\left[\begin{array}{cccccc} 0 & 0 & 0 & \cdots & 0 & 0 \\ 0 & 0 & 0 & \cdots & 0 & 0 \\ \vdots & \vdots & \vdots & & \vdots & \vdots \\ 0 & 0 & 0 & \cdots & 0 & 0 \\ \epsilon & 0 & 0 & \cdots & 0 & 0 \end{array}\right]=\epsilon \boldsymbol{e}_{n} \boldsymbol{e}_{1}^{T} .$	$\boldsymbol{A}_{1}:=\left[\begin{array}{cccccc} 0 & 1 & 0 & \cdots & 0 & 0 \\ 0 & 0 & 1 & \cdots & 0 & 0 \\ \vdots & \vdots & \vdots & & \vdots & \vdots \\ 0 & 0 & 0 & \cdots & 0 & 1 \\ 0 & 0 & 0 & \cdots & 0 & 0 \end{array}\right], \quad \boldsymbol{E}:=\left[\begin{array}{cccccc} 0 & 0 & 0 & \cdots & 0 & 0 \\ 0 & 0 & 0 & \cdots & 0 & 0 \\ \vdots & \vdots & \vdots & & \vdots & \vdots \\ 0 & 0 & 0 & \cdots & 0 & 0 \\ \epsilon & 0 & 0 & \cdots & 0 & 0 \end{array}\right]=\epsilon \boldsymbol{e}_{n} \boldsymbol{e}_{1}^{T} .$
lyche-numerical-linear-algebra_EQ0926 (13.56)	314	0.996	`L_{h} v=\boldsymbol{F}, \quad L_{h} v:=\frac{1}{h^{2}} \left[\begin{array}{ccc} (d v)_{1,1} & \ldots & (d v)_{1, m} \\ \vdots & & \vdots \\ (d v)_{m, 1} & \ldots & (d v)_{m, m} \end{array}\right], \quad \boldsymbol{F}:= \left[\begin{array}{ccc} f_{1,1} & \ldots & f_{1, m} \\ \vdots & & \vdots \\ f_{m, 1} & \ldots & f_{m, m} \end{array}\right] .`	$L_{h} v=\boldsymbol{F}, \quad L_{h} v:=\frac{1}{h^{2}} \left[\begin{array}{ccc} (d v)_{1,1} & \ldots & (d v)_{1, m} \\ \vdots & & \vdots \\ (d v)_{m, 1} & \ldots & (d v)_{m, m} \end{array}\right], \quad \boldsymbol{F}:= \left[\begin{array}{ccc} f_{1,1} & \ldots & f_{1, m} \\ \vdots & & \vdots \\ f_{m, 1} & \ldots & f_{m, m} \end{array}\right] .$	$L_{h} v=\boldsymbol{F}, \quad L_{h} v:=\frac{1}{h^{2}} \left[\begin{array}{ccc} (d v)_{1,1} & \ldots & (d v)_{1, m} \\ \vdots & & \vdots \\ (d v)_{m, 1} & \ldots & (d v)_{m, m} \end{array}\right], \quad \boldsymbol{F}:= \left[\begin{array}{ccc} f_{1,1} & \ldots & f_{1, m} \\ \vdots & & \vdots \\ f_{m, 1} & \ldots & f_{m, m} \end{array}\right] .$

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lyche-numerical-linear-algebra_ EQ1024	346	0.996	`\lim _{k \rightarrow \infty}\left(\frac{\left| \lambda_{1}\right|}{\lambda_{1}}\right)^{k} \boldsymbol{x}_{k}=\frac{c_{1}}{\left|c_{1}\right|} \frac{\boldsymbol{v}_{1}}{\left\\|\boldsymbol{v}_{1}\right \\|} .`	$\lim_{k\rightarrow\infty}\left(\frac{\left\|\lambda_{1}\right\|}{\lambda_{1}}\right)^{k}\boldsymbol{x}_{k}=\frac{c_{1}}{\left\|c_{1}\right\|}\frac{\boldsymbol{v}_{1}}{\left\|\boldsymbol{v}_{1}\right\|}.$	$\lim_{k\rightarrow\infty}\left(\frac{\left\|\lambda_{1}\right\|}{\lambda_{1}}\right)^{k}\boldsymbol{x}_{k}=\frac{c_{1}}{\left\|c_{1}\right\|}\frac{\boldsymbol{v}_{1}}{\left\|\boldsymbol{v}_{1}\right\|}.$
lyche-numerical-linear-algebra_ EQ0031	32	0.996	`\boldsymbol{A} \boldsymbol{x}=\left[\begin{array}{cccc} a_{11} & a_{12} & \cdots & a_{1 n} \\ a_{21} & a_{22} & \cdots & a_{2 n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m 1} & a_{m 2} & \cdots & a_{m n} \end{array}\right] \left[\begin{array}{c} x_{1} \\ x_{2} \\ \vdots \\ x_{n} \end{array}\right]=\left[\begin{array}{c} b_{1} \\ b_{2} \\ \vdots \\ b_{m} \end{array}\right]=\boldsymbol{b} .`	$\boldsymbol{A}\boldsymbol{x}=\left[\begin{array}{cccc} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{array}\right] \left[\begin{array}{c} x_{1} \\ x_{2} \\ \vdots \\ x_{n} \end{array}\right]=\left[\begin{array}{c} b_{1} \\ b_{2} \\ \vdots \\ b_{m} \end{array}\right]=\boldsymbol{b}.$	$\boldsymbol{A}\boldsymbol{x}=\left[\begin{array}{cccc} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{array}\right] \left[\begin{array}{c} x_{1} \\ x_{2} \\ \vdots \\ x_{n} \end{array}\right]=\left[\begin{array}{c} b_{1} \\ b_{2} \\ \vdots \\ b_{m} \end{array}\right]=\boldsymbol{b}.$
lyche-numerical-linear-algebra_ EQ0207	86	0.996	`\begin{aligned} (\boldsymbol{L} \boldsymbol{U})_{i j} & =\sum_{k=1}^{n} l_{i, k} u_{k j}=\sum_{k=1}^{i-1} a_{p_{i}, k}^{(k)} a_{p_{k}, j}^{(k)}+a_{p_{i}, j}^{(i)} \\ & =\sum_{k=1}^{i-1}\left(a_{p_{i}, j}^{(k)}-a_{p_{i}, j}^{(k+1)}\right)+a_{p_{i}, j}^{(i)}=a_{p_{i}, j}^{(1)}=a_{p_{i}, j}=\left(\boldsymbol{P}^{T} \boldsymbol{A}\right)_{i j}, \end{aligned}`	$\begin{aligned} (\boldsymbol{L}\boldsymbol{U})_{ij} & =\sum_{k=1}^{n} l_{i,k} u_{kj}=\sum_{k=1}^{i-1} a_{p_i,k}^{(k)} a_{p_k,j}^{(k)}+a_{p_i,j}^{(i)} \\ & =\sum_{k=1}^{i-1}\left(a_{p_i,j}^{(k)}-a_{p_i,j}^{(k+1)}\right)+a_{p_i,j}^{(i)}=a_{p_i,j}^{(1)}=a_{p_i,j}=a_{p_i,j}=\left(\boldsymbol{P}^{T}\boldsymbol{A}\right)_{ij}, \end{aligned}$	$\begin{aligned} (\boldsymbol{L}\boldsymbol{U})_{ij} & =\sum_{k=1}^{n} l_{i,k} u_{kj}=\sum_{k=1}^{i-1} a_{p_i,k}^{(k)} a_{p_k,j}^{(k)}+a_{p_i,j}^{(i)} \\ & =\sum_{k=1}^{i-1}\left(a_{p_i,j}^{(k)}-a_{p_i,j}^{(k+1)}\right)+a_{p_i,j}^{(i)}=a_{p_i,j}^{(1)}=a_{p_i,j}=a_{p_i,j}=\left(\boldsymbol{P}^{T}\boldsymbol{A}\right)_{ij}, \end{aligned}$
lyche-numerical-linear-algebra_ EQ0739	261	0.996	`\boldsymbol{D} \boldsymbol{X}+\boldsymbol{X} \boldsymbol{D}-\frac{1}{6} \boldsymbol{D} \boldsymbol{X} \boldsymbol{D}=4 h^{4} \boldsymbol{G}, \text { where } \boldsymbol{G}=\boldsymbol{S} \mu \boldsymbol{F} \boldsymbol{S},`	$\boldsymbol{D}\boldsymbol{X}+\boldsymbol{X}\boldsymbol{D}-\frac{1}{6}\boldsymbol{D}\boldsymbol{X}\boldsymbol{D}=4h^{4}\boldsymbol{G},\ \text{where}\ \boldsymbol{G}=\boldsymbol{S}\mu\boldsymbol{F}\boldsymbol{S},$	$\boldsymbol{D}\boldsymbol{X}+\boldsymbol{X}\boldsymbol{D}-\frac{1}{6}\boldsymbol{D}\boldsymbol{X}\boldsymbol{D}=4h^{4}\boldsymbol{G},\ \text{where}\ \boldsymbol{G}=\boldsymbol{S}\mu\boldsymbol{F}\boldsymbol{S},$
lyche-numerical-linear-algebra_ EQ0787 (12.27)	277	0.996	`\rho\left(\boldsymbol{G}_{\omega}\right)= \begin{cases} \frac{1}{4}\left(\omega \beta+\sqrt{(\omega \beta)^{2}-4(\omega-1)}\right)^{2}, & \text { for } 0<\omega \leq \omega^{*}, \\ \omega-1, & \text { for } \omega^{*}<\omega<2,\end{cases}`	$\rho\left(\boldsymbol{G}_{\omega}\right)=\begin{cases}\frac{1}{4}\left(\omega\beta+\sqrt{(\omega\beta)^{2}-4(\omega-1)}\right)^{2}, & \text{for } 0<\omega\leq\omega^{*}, \\ \omega-1, & \text{for } \omega^{*}<\omega<2,\end{cases}$	$\rho\left(\boldsymbol{G}_{\omega}\right)=\begin{cases}\frac{1}{4}\left(\omega\beta+\sqrt{(\omega\beta)^{2}-4(\omega-1)}\right)^{2}, & \textit{for } 0<\omega\leq\omega^{*}, \\ \omega-1, & \textit{for } \omega^{*}<\omega<2,\end{cases}$
lyche-numerical-linear-algebra_ EQ0819	285	0.996	`d(\omega):=(\omega \mu)^{2}-4(\omega-1) .`	$d(\omega):=(\omega\mu)^{2}-4(\omega-1).$	$d(\omega):=(\omega\mu)^{2}-4(\omega-1).$
lyche-numerical-linear-algebra_ EQ0850 (13.16)	295	0.996	`\boldsymbol{r}_{j}^{T} \boldsymbol{A} \boldsymbol{p}_{i} \stackrel{(13.13)}{=} \boldsymbol{r}_{j}^{T}\left(\frac{ \boldsymbol{r}_{i}-\boldsymbol{r}_{i+1}}{\alpha_{i}} \right)=0, \quad i=0,1, \ldots, j-2 .`	$\boldsymbol{r}_{j}^{T}\boldsymbol{A}\boldsymbol{p}_{i}\overset{(13.13)}{=}\boldsymbol{r}_{j}^{T}\left(\frac{\boldsymbol{r}_{i}-\boldsymbol{r}_{i+1}}{\alpha_{i}}\right)=0,\quad i=0,1,\ldots,j-2.$	$\boldsymbol{r}_{j}^{T}\boldsymbol{A}\boldsymbol{p}_{i}\overset{(13.13)}{=}\boldsymbol{r}_{j}^{T}\left(\frac{\boldsymbol{r}_{i}-\boldsymbol{r}_{i+1}}{\alpha_{i}}\right)=0,\quad i=0,1,\ldots,j-2.$

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lyche-numerical-linear-algebra_EQ0991	334	0.996	`\begin{aligned} \boldsymbol{A}_{k+1} & = \boldsymbol{H}_{k} \boldsymbol{A}_{k} \boldsymbol{H}_{k}= \left[\begin{array}{cc} \boldsymbol{I}_{k} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{V}_{k} \end{array} \right]\left[\begin{array}{ll} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \\ \boldsymbol{D}_{k} & \boldsymbol{E}_{k} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{I}_{k} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{V}_{k} \end{array}\right] \\ & =\left[\begin{array}{cc} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \boldsymbol{V}_{k} \\ \ \ \boldsymbol{V}_{k} \boldsymbol{D}_{k} & \boldsymbol{V}_{k} \boldsymbol{E}_{k} \boldsymbol{V}_{k} \end{array}\right] . \end{aligned}`	$\begin{aligned} \boldsymbol{A}_{k+1} & = \boldsymbol{H}_{k} \boldsymbol{A}_{k} \boldsymbol{H}_{k}= \left[\begin{array}{cc} \boldsymbol{I}_{k} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{V}_{k} \end{array} \right]\left[\begin{array}{ll} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \\ \boldsymbol{D}_{k} & \boldsymbol{E}_{k} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{I}_{k} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{V}_{k} \end{array}\right] \\ & =\left[\begin{array}{cc} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \boldsymbol{V}_{k} \\ \boldsymbol{V}_{k} \boldsymbol{D}_{k} & \boldsymbol{V}_{k} \boldsymbol{E}_{k} \boldsymbol{V}_{k} \end{array}\right] . \end{aligned}$	$\begin{aligned} \boldsymbol{A}_{k+1} & = \boldsymbol{H}_{k} \boldsymbol{A}_{k} \boldsymbol{H}_{k}= \left[\begin{array}{cc} \boldsymbol{I}_{k} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{V}_{k} \end{array} \right]\left[\begin{array}{ll} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \\ \boldsymbol{D}_{k} & \boldsymbol{E}_{k} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{I}_{k} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{V}_{k} \end{array}\right] \\ & =\left[\begin{array}{cc} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \boldsymbol{V}_{k} \\ \boldsymbol{V}_{k} \boldsymbol{D}_{k} & \boldsymbol{V}_{k} \boldsymbol{E}_{k} \boldsymbol{V}_{k} \end{array}\right] . \end{aligned}$
lyche-numerical-linear-algebra_EQ0454 (7.14)	181	0.997	`\boldsymbol{X}_{k+1}=\frac{1}{2}\left(\boldsymbol{X}_{k}+ \boldsymbol{X}_{k}^{-T}\right), k=0,1,2, \ldots \text { with } \boldsymbol{X}_{0}=\boldsymbol{A},`	$\boldsymbol{X}_{k+1}=\frac{1}{2}\left(\boldsymbol{X}_{k}+ \boldsymbol{X}_{k}^{-T}\right), k=0,1,2, \ldots \text { with } \boldsymbol{X}_{0}=\boldsymbol{A},$	$\boldsymbol{X}_{k+1}=\frac{1}{2}\left(\boldsymbol{X}_{k}+ \boldsymbol{X}_{k}^{-T}\right), k=0,1,2, \ldots \text { with } \boldsymbol{X}_{0}=\boldsymbol{A},$
lyche-numerical-linear-algebra_EQ0135	64	0.997	`\left[\begin{array}{l} A_{1} \\ A_{2} \end{array}\right] B=\left[\begin{array}{l} A_{1} B \\ A_{2} B \end{array} \right] .`	$\left[\begin{array}{l} A_{1} \\ A_{2} \end{array}\right] B=\left[\begin{array}{l} A_{1} B \\ A_{2} B \end{array} \right] .$	$\left[\begin{array}{l} A_{1} \\ A_{2} \end{array}\right] \boldsymbol{B}=\left[\begin{array}{l} A_{1} \boldsymbol{B} \\ A_{2} \boldsymbol{B} \end{array} \right] .$
lyche-numerical-linear-algebra_EQ0269 (4.11)	110	0.997	`\begin{aligned} & \text { if } A(1,1)>0 \\ & A(1,1)=\sqrt{A(1,1)} \\ & A(2: n, 1)=A(2: n, 1) / A(1,1) \\ & \text { for } j=2: n \\ & \quad A(j: n, j)=A(j: n, j)-A(j, 1) * A(j: n, 1) \end{aligned}`	$\begin{aligned} & \text { if } A(1,1)>0 \\ & A(1,1)=\sqrt{A(1,1)} \\ & A(2: n, 1)=A(2: n, 1) / A(1,1) \\ & \text { for } j=2: n \\ & \quad A(j: n, j)=A(j: n, j)-A(j, 1) * A(j: n, 1) \end{aligned}$	$\begin{aligned} & \text { if } A(1,1)>0 \\ & A(1,1)=\sqrt{A(1,1)} \\ & A(2: n, 1)=A(2: n, 1) / A(1,1) \\ & \text { for } j=2: n \\ & \quad A(j: n, j)=A(j: n, j)-A(j, 1) * A(j: n, 1) \end{aligned}$
lyche-numerical-linear-algebra_EQ0431	173	0.997	`\boldsymbol{B}\left[\begin{array}{l} 1 \\ 1 \end{array} \right]=4\left[\begin{array}{l} 1 \\ 1 \end{array} \right], \quad \boldsymbol{B}\left[\begin{array}{r} 1 \\ -1 \end{array}\right]=0\left[\begin{array}{r} 1 \\ -1 \end{array}\right],`	$\boldsymbol{B}\left[\begin{array}{l} 1 \\ 1 \end{array} \right]=4\left[\begin{array}{l} 1 \\ 1 \end{array} \right], \quad \boldsymbol{B}\left[\begin{array}{r} 1 \\ -1 \end{array}\right]=0\left[\begin{array}{r} 1 \\ -1 \end{array}\right],$	$\boldsymbol{B}\left[\begin{array}{l} 1 \\ 1 \end{array} \right]=4\left[\begin{array}{l} 1 \\ 1 \end{array} \right], \quad \boldsymbol{B}\left[\begin{array}{r} 1 \\ -1 \end{array}\right]=0\left[\begin{array}{r} 1 \\ -1 \end{array}\right],$
lyche-numerical-linear-algebra_EQ0656 (10.1)	238	0.997	`\begin{gathered} -\Delta u:=-\frac{\partial^{2} u}{ \partial x^{2}}-\frac{\partial^{2} u}{\partial y^{2}}=f \text { on } \Omega, \\ u:=0 \text { on } \partial \Omega . \end{gathered}`	$\begin{gathered} -\Delta u:=-\frac{\partial^{2} u}{ \partial x^{2}}-\frac{\partial^{2} u}{\partial y^{2}}=f \text { on } \Omega, \\ u:=0 \text { on } \partial \Omega . \end{gathered}$	$\begin{gathered} -\Delta u:=-\frac{\partial^{2} u}{ \partial x^{2}}-\frac{\partial^{2} u}{\partial y^{2}}=f \text { on } \Omega, \\ u:=0 \text { on } \partial \Omega . \end{gathered}$
lyche-numerical-linear-algebra_EQ0666 (10.7)	240	0.997	`\boldsymbol{A} \boldsymbol{x}=\boldsymbol{b}, \quad \boldsymbol{A} \in \mathbb{R}^{n \times n}, \quad b \in \mathbb{R}^{n}, \quad n=m^{2},`	$\boldsymbol{A} \boldsymbol{x}=\boldsymbol{b}, \quad \boldsymbol{A} \in \mathbb{R}^{n \times n}, \quad b \in \mathbb{R}^{n}, \quad n=m^{2},$	$\boldsymbol{A} \boldsymbol{x}=\boldsymbol{b}, \quad \boldsymbol{A} \in \mathbb{R}^{n \times n}, \quad b \in \mathbb{R}^{n}, \quad n=m^{2},$

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lyche-numerical-linear-algebra_EQ0671 (10.11)	242	0.997	`\boldsymbol{T}_{2}=\left[\begin{array}{rrr|rrr|rrr} 2 d & a & 0 & a & 0 & 0 & 0 & 0 & 0 \\ a & 2 d & a & 0 & a & 0 & 0 & 0 & 0 \\ 0 & a & 2 d & 0 & 0 & a & 0 & 0 & 0 \\ \hline a & 0 & 0 & 2 d & a & 0 & a & 0 & 0 \\ 0 & a & 0 & a & 2 d & a & 0 & a & 0 \\ 0 & 0 & a & 0 & a & 2 d & 0 & 0 & a \\ \hline 0 & 0 & 0 & a & 0 & 0 & 2 d & a & 0 \\ 0 & 0 & 0 & 0 & a & 0 & a & 2 d & a \\ 0 & 0 & 0 & 0 & 0 & a & 0 & a & 2 d \end{array}\right] .`	$\boldsymbol{T}_{2}=\left[\begin{array}{rrr\|rrr\|rrr} 2 d & a & 0 & a & 0 & 0 & 0 & 0 & 0 \\ a & 2 d & a & 0 & a & 0 & 0 & 0 & 0 \\ 0 & a & 2 d & 0 & 0 & a & 0 & 0 & 0 \\ \hline a & 0 & 0 & 2 d & a & 0 & a & 0 & 0 \\ 0 & a & 0 & a & 2 d & a & 0 & a & 0 \\ 0 & 0 & a & 0 & a & 2 d & 0 & 0 & a \\ \hline 0 & 0 & 0 & a & 0 & 0 & 2 d & a & 0 \\ 0 & 0 & 0 & 0 & a & 0 & a & 2 d & a \\ 0 & 0 & 0 & 0 & 0 & a & 0 & a & 2 d \end{array}\right] .$	$\boldsymbol{T}_{2}=\left[\begin{array}{rrr\|rrr\|rrr} 2 d & a & 0 & a & 0 & 0 & 0 & 0 & 0 \\ a & 2 d & a & 0 & a & 0 & 0 & 0 & 0 \\ 0 & a & 2 d & 0 & 0 & a & 0 & 0 & 0 \\ \hline a & 0 & 0 & 2 d & a & 0 & a & 0 & 0 \\ 0 & a & 0 & a & 2 d & a & 0 & a & 0 \\ 0 & 0 & a & 0 & a & 2 d & 0 & 0 & a \\ \hline 0 & 0 & 0 & a & 0 & 0 & 2 d & a & 0 \\ 0 & 0 & 0 & 0 & a & 0 & a & 2 d & a \\ 0 & 0 & 0 & 0 & 0 & a & 0 & a & 2 d \end{array}\right] .$
lyche-numerical-linear-algebra_EQ1010 (14.10)	340	0.997	`a_{k j}=\left\{\begin{array}{ll} 1, & j=k+1, \\ 0, & \text { otherwise }, \end{array} \quad e_{k j}= \begin{cases}\epsilon, & k=n, j=1, \\ 0, & \text { otherwise },\end{cases}\right.`	$a_{kj}=\left\{\begin{array}{ll} 1, & j=k+1, \\ 0, & \text { otherwise }, \end{array} \quad e_{kj}=\begin{cases}\epsilon, & k=n, j=1, \\ 0, & \text { otherwise },\end{cases}\right.$	$a_{kj}=\begin{cases}1, & j=k+1, \\ 0, & \text{otherwise},\end{cases} \quad e_{kj}=\begin{cases}\epsilon, & k=n, j=1, \\ 0, & \text{otherwise},\end{cases}$
lyche-numerical-linear-algebra_EQ0294 (5.10)	122	0.997	`\boldsymbol{s}_{0}=\sum_{i=1}^{k} \frac{\left\langle \boldsymbol{v}, \boldsymbol{v}_{i}\right\rangle}{\left \langle\boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right \rangle} \boldsymbol{v}_{i} .`	$\boldsymbol{s}_{0}=\sum_{i=1}^{k} \frac{\left\langle \boldsymbol{v}, \boldsymbol{v}_{i}\right\rangle}{\left \langle\boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right \rangle} \boldsymbol{v}_{i} .$	$\boldsymbol{s}_{0}=\sum_{i=1}^{k} \frac{\left\langle \boldsymbol{v}, \boldsymbol{v}_{i}\right\rangle}{\left \langle\boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right \rangle} \boldsymbol{v}_{i} .$
lyche-numerical-linear-algebra_EQ0416	166	0.997	`B_{1}:=\left\{\boldsymbol{x} \in \mathbb{R}^{n} \mid| \boldsymbol{x}\\|_{2}=1\right\} .`	$B_{1}:=\left\{\boldsymbol{x} \in \mathbb{R}^{n} \mid\| \boldsymbol{x}\\|_{2}=1\right\} .$	$B_{1}:=\left\{\boldsymbol{x} \in \mathbb{R}^{n} \mid\| \boldsymbol{x}\\|_{2}=1\right\} .$
lyche-numerical-linear-algebra_EQ0694 (10.24)	248	0.997	`\begin{array}{rlrl} -\Delta v(s, t) & =f(s, t) & & (s, t) \in \Omega \\ -\Delta u(s, t) & =v(s, t) & & (s, t) \in \Omega \\ u(s, t) & =v(s, t)=0 & (s, t) \in \partial \Omega \end{array}`	$\begin{array}{rlrl} -\Delta v(s, t) & =f(s, t) & & (s, t) \in \Omega \\ -\Delta u(s, t) & =v(s, t) & & (s, t) \in \Omega \\ u(s, t) & =v(s, t)=0 & (s, t) \in \partial \Omega \end{array}$	$\begin{array}{rlrl} -\Delta v(s, t) & =f(s, t) & & (s, t) \in \Omega \\ -\Delta u(s, t) & =v(s, t) & & (s, t) \in \Omega \\ u(s, t) & =v(s, t)=0 & (s, t) \in \partial \Omega . \end{array}$
lyche-numerical-linear-algebra_EQ0768 (12.16)	272	0.997	`\boldsymbol{x}_{k}-\boldsymbol{x}=\boldsymbol{G}^{k} \left(\boldsymbol{x}_{0}-\boldsymbol{x}\right), \quad k=0,1,2, \ldots`	$\boldsymbol{x}_{k}-\boldsymbol{x}=\boldsymbol{G}^{k} \left(\boldsymbol{x}_{0}-\boldsymbol{x}\right), \quad k=0,1,2, \ldots$	$\boldsymbol{x}_{k}-\boldsymbol{x}=\boldsymbol{G}^{k}(\boldsymbol{x}_{0}-\boldsymbol{x}), \quad k=0,1,2, \ldots$
lyche-numerical-linear-algebra_EQ0815	284	0.997	`\boldsymbol{G}_{J} \boldsymbol{v}=(\boldsymbol{L}+ \boldsymbol{R}) \boldsymbol{v}=\frac{\lambda+\omega-1}{ \omega \lambda^{1 / 2}} \boldsymbol{v}=\mu \boldsymbol{v} .`	$\boldsymbol{G}_{J} \boldsymbol{v}=(\boldsymbol{L}+ \boldsymbol{R}) \boldsymbol{v}=\frac{\lambda+\omega-1}{ \omega \lambda^{1 / 2}} \boldsymbol{v}=\mu \boldsymbol{v} .$	$\boldsymbol{G}_{J} \boldsymbol{v}=(\boldsymbol{L}+ \boldsymbol{R}) \boldsymbol{v}=\frac{\lambda+\omega-1}{ \omega \lambda^{1 / 2}} \boldsymbol{v}=\mu \boldsymbol{v} .$
lyche-numerical-linear-algebra_EQ0847 (13.11)	294	0.997	`\begin{aligned} & \boldsymbol{t}_{2 k-2}=3 * 4^{1-k} \left[\begin{array}{c} 1 \\ -1 / 2 \end{array} \right], \quad \boldsymbol{x}_{2 k-1}=-4^{-k}\left[\begin{array}{l} 1 \\ 2 \end{array}\right], \quad \boldsymbol{r}_{2 k-1}=3 * 4^{-k}\left[\begin{array}{l} 0 \\ 1 \end{array}\right] \\ & \boldsymbol{t}_{2 k-1}=3 * 4^{-k}\left[\begin{array}{c} -1 \\ 2 \end{array} \right], \quad \boldsymbol{x}_{2 k}=-4^{-k}\left[\begin{array}{c} 1 \\ 1 / 2 \end{array}\right], \quad \boldsymbol{r}_{2 k}=3 * 4^{-k}\left[\begin{array}{c} 1 / 2 \\ 0 \end{array}\right] . \end{aligned}`	$\begin{aligned} & \boldsymbol{t}_{2 k-2}=3 * 4^{1-k} \left[\begin{array}{c} 1 \\ -1 / 2 \end{array} \right], \quad \boldsymbol{x}_{2 k-1}=-4^{-k}\left[\begin{array}{l} 1 \\ 2 \end{array}\right], \quad \boldsymbol{r}_{2 k-1}=3 * 4^{-k}\left[\begin{array}{l} 0 \\ 1 \end{array}\right] \\ & \boldsymbol{t}_{2 k-1}=3 * 4^{-k}\left[\begin{array}{c} -1 \\ 2 \end{array} \right], \quad \boldsymbol{x}_{2 k}=-4^{-k}\left[\begin{array}{c} 1 \\ 1 / 2 \end{array}\right], \quad \boldsymbol{r}_{2 k}=3 * 4^{-k}\left[\begin{array}{c} 1 / 2 \\ 0 \end{array}\right] . \end{aligned}$	$\begin{aligned} & \boldsymbol{t}_{2 k-2}=3 * 4^{1-k} \left[\begin{array}{c} 1 \\ -1 / 2 \end{array} \right], \quad \boldsymbol{x}_{2 k-1}=-4^{-k}\left[\begin{array}{l} 1 \\ 2 \end{array}\right], \quad \boldsymbol{r}_{2 k-1}=3 * 4^{-k}\left[\begin{array}{l} 0 \\ 1 \end{array}\right] \\ & \boldsymbol{t}_{2 k-1}=3 * 4^{-k}\left[\begin{array}{c} -1 \\ 2 \end{array} \right], \quad \boldsymbol{x}_{2 k}=-4^{-k}\left[\begin{array}{c} 1 \\ 1 / 2 \end{array}\right], \quad \boldsymbol{r}_{2 k}=3 * 4^{-k}\left[\begin{array}{c} 1 / 2 \\ 0 \end{array}\right] . \end{aligned}$

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lyche-numerical-linear-algebra_EQ0355 (5.22)	142	0.998	P_{i_{1}, n+1} P_{i_{2}, n+1} \cdots P_{i_{n}, n+1}\left[\begin{array}{c} \boldsymbol{L}^{*} \\ \boldsymbol{z}^{*} \end{array}\right]=\left[\begin{array}{c} \boldsymbol{R}^{\prime} \\ 0 \end{array} \right],	$P_{i_1,n+1}P_{i_2,n+1}\cdots P_{i_n,n+1}\left[\begin{array}{c} \boldsymbol{L}^{*} \\ \boldsymbol{z}^{*} \end{array}\right]=\left[\begin{array}{c} \boldsymbol{R}^{\prime} \\ 0 \end{array} \right],$	$P_{i_1,n+1}P_{i_2,n+1}\cdots P_{i_n,n+1}\left[\begin{array}{c} \boldsymbol{L}^{*} \\ \boldsymbol{z}^{*} \end{array}\right]=\left[\begin{array}{c} \boldsymbol{R}^{\prime} \\ 0 \end{array} \right],$
lyche-numerical-linear-algebra_EQ0390 (6.11)	157	0.998	\lambda_{k} \leq \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x}),	$\lambda_k \leq \max_{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x}),$	$\lambda_k \leq \max_{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x}),$
lyche-numerical-linear-algebra_EQ0448	179	0.998	A:=\frac{1}{15}\left[\begin{array}{ccc} 14 & 4 & 16 \\ 2 & 22 & 13 \end{array}\right] \in \mathbb{R}^{2 \times 3} .	$A:=\frac{1}{15}\left[\begin{array}{ccc} 14 & 4 & 16 \\ 2 & 22 & 13 \end{array}\right] \in \mathbb{R}^{2 \times 3} .$	$\boldsymbol{A}:=\frac{1}{15}\left[\begin{array}{ccc} 14 & 4 & 16 \\ 2 & 22 & 13 \end{array}\right] \in \mathbb{R}^{2 \times 3} .$
lyche-numerical-linear-algebra_EQ0765	272	0.998	x_{k+1}(1)=\frac{1}{2} x_{k}(2)+\frac{1}{2}, \quad x_{k+1}(2)=\frac{1}{2} x_{k+1}(1)+\frac{1}{2} .	$x_{k+1}(1)=\frac{1}{2} x_{k}(2)+\frac{1}{2}, \quad x_{k+1}(2)=\frac{1}{2} x_{k+1}(1)+\frac{1}{2} .$	$\boldsymbol{x}_{k+1}(1)=\frac{1}{2} \boldsymbol{x}_{k}(2)+\frac{1}{2}, \quad \boldsymbol{x}_{k+1}(2)=\frac{1}{2} \boldsymbol{x}_{k+1}(1)+\frac{1}{2} .$
lyche-numerical-linear-algebra_EQ0603 (9.8)	222	0.998	\boldsymbol{A} \boldsymbol{A}^{\dagger} \boldsymbol{A}= \boldsymbol{A}, \boldsymbol{A}^{\dagger} \boldsymbol{A} \boldsymbol{A}^{\dagger}=\boldsymbol{A}^{\dagger},\left(\boldsymbol{A}^{\dagger} \boldsymbol{A}\right)^{*}= \boldsymbol{A}^{\dagger} \boldsymbol{A},\left(\boldsymbol{A} \boldsymbol{A}^{\dagger}\right)^{*}= \boldsymbol{A} \boldsymbol{A}^{\dagger} .	$\boldsymbol{A} \boldsymbol{A}^{\dagger} \boldsymbol{A}= \boldsymbol{A}, \boldsymbol{A}^{\dagger} \boldsymbol{A} \boldsymbol{A}^{\dagger}=\boldsymbol{A}^{\dagger},\left(\boldsymbol{A}^{\dagger} \boldsymbol{A}\right)^{*}= \boldsymbol{A}^{\dagger} \boldsymbol{A},\left(\boldsymbol{A} \boldsymbol{A}^{\dagger}\right)^{*}= \boldsymbol{A} \boldsymbol{A}^{\dagger} .$	$\boldsymbol{A} \boldsymbol{A}^{\dagger} \boldsymbol{A}= \boldsymbol{A}, \boldsymbol{A}^{\dagger} \boldsymbol{A} \boldsymbol{A}^{\dagger}=\boldsymbol{A}^{\dagger},\left(\boldsymbol{A}^{\dagger} \boldsymbol{A}\right)^{*}= \boldsymbol{A}^{\dagger} \boldsymbol{A},\left(\boldsymbol{A} \boldsymbol{A}^{\dagger}\right)^{*}= \boldsymbol{A} \boldsymbol{A}^{\dagger} .$
lyche-numerical-linear-algebra_EQ0981	331	0.998	\boldsymbol{X} \boldsymbol{D}_{1}^{-1} \boldsymbol{X}^{-1} \boldsymbol{r}=\left(\boldsymbol{X}(\boldsymbol{D}-\mu \boldsymbol{I}) \boldsymbol{X}^{-1} \right)^{-1} \boldsymbol{r}=(\boldsymbol{A}-\mu \boldsymbol{I})^{-1}(\boldsymbol{A}-\mu \boldsymbol{I})\boldsymbol{x}=\boldsymbol{x} .	$\boldsymbol{X} \boldsymbol{D}_{1}^{-1} \boldsymbol{X}^{-1} \boldsymbol{r}=\left(\boldsymbol{X}(\boldsymbol{D}-\mu \boldsymbol{I}) \boldsymbol{X}^{-1} \right)^{-1} \boldsymbol{r}=(\boldsymbol{A}-\mu \boldsymbol{I})^{-1}(\boldsymbol{A}-\mu \boldsymbol{I})\boldsymbol{x}=\boldsymbol{x} .$	$\boldsymbol{X} \boldsymbol{D}_{1}^{-1} \boldsymbol{X}^{-1} \boldsymbol{r}=\left(\boldsymbol{X}(\boldsymbol{D}-\mu \boldsymbol{I}) \boldsymbol{X}^{-1} \right)^{-1} \boldsymbol{r}=(\boldsymbol{A}-\mu \boldsymbol{I})^{-1}(\boldsymbol{A}-\mu \boldsymbol{I})\boldsymbol{x}=\boldsymbol{x} .$
lyche-numerical-linear-algebra_EQ0228 (3.19)	92	0.998	\boldsymbol{A}:=\left[\begin{array}{ccc} \boldsymbol{A}_{11} & \cdots & \boldsymbol{A}_{1 m} \\ \vdots & & \vdots \\ \boldsymbol{A}_{m 1} & \cdots & \boldsymbol{A}_{m m} \end{array}\right],	$\boldsymbol{A}:=\left[\begin{array}{ccc} \boldsymbol{A}_{11} & \cdots & \boldsymbol{A}_{1 m} \\ \vdots & & \vdots \\ \boldsymbol{A}_{m 1} & \cdots & \boldsymbol{A}_{m m} \end{array}\right],$	$\boldsymbol{A}:=\left[\begin{array}{ccc} \boldsymbol{A}_{11} & \cdots & \boldsymbol{A}_{1 m} \\ \vdots & & \vdots \\ \boldsymbol{A}_{m 1} & \cdots & \boldsymbol{A}_{m m} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0691	247	0.998	\boldsymbol{A}=\left[\begin{array}{rrrr} 2 d & a & a & 0 \\ a & 2 d & 0 & a \\ a & 0 & 2 d & a \\ 0 & a & a & 2 d \end{array}\right] .	$\boldsymbol{A}=\left[\begin{array}{rrrr} 2 d & a & a & 0 \\ a & 2 d & 0 & a \\ a & 0 & 2 d & a \\ 0 & a & a & 2 d \end{array}\right] .$	$\boldsymbol{A}=\left[\begin{array}{rrrr} 2 d & a & a & 0 \\ a & 2 d & 0 & a \\ a & 0 & 2 d & a \\ 0 & a & a & 2 d \end{array}\right] .$
lyche-numerical-linear-algebra_EQ1035 (15.8)	351	0.998	\begin{aligned} & \boldsymbol{A}_{1}=\boldsymbol{A} \\ & \text { for } k=1,2, \ldots \\ & \quad \boldsymbol{Q}_{k} \boldsymbol{R}_{k}=\boldsymbol{A}_{k} \quad\left(\text { QR factorization of } \boldsymbol{A}_{k} \right) \\ & \boldsymbol{A}_{k+1}=\boldsymbol{R}_{k} \boldsymbol{Q}_{k} . \end{aligned}	$\begin{aligned} & \boldsymbol{A}_{1}=\boldsymbol{A} \\ & \text { for } k=1,2, \ldots \\ & \quad \boldsymbol{Q}_{k} \boldsymbol{R}_{k}=\boldsymbol{A}_{k} \quad\left(\text { QR factorization of } \boldsymbol{A}_{k} \right) \\ & \boldsymbol{A}_{k+1}=\boldsymbol{R}_{k} \boldsymbol{Q}_{k} . \end{aligned}$	$\begin{aligned} & \boldsymbol{A}_{1}=\boldsymbol{A} \\ & \text { for } k=1,2, \ldots \\ & \quad \boldsymbol{Q}_{k} \boldsymbol{R}_{k}=\boldsymbol{A}_{k} \quad\left(\text { QR factorization of } \boldsymbol{A}_{k} \right) \\ & \boldsymbol{A}_{k+1}=\boldsymbol{R}_{k} \boldsymbol{Q}_{k} . \end{aligned}$

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lyche-numerical-linear-algebra_EQ0012	24	■ 0.998	\boldsymbol{A}\left(r_{1}: r_{2}, c_{1}: c_{2}\right):= \left[\begin{array}{rrrr} a_{r_{1}, c_{1}} & a_{r_{1}, c_{1}+1} & \cdots & a_{r_{1}, c_{2}} \\ a_{r_{1}+1, c_{1}} & a_{r_{1}+1, c_{1}+1} & \cdots & a_{r_{1}+1, c_{2}} \\ \vdots & \vdots & \ddots & \vdots \\ a_{r_{2}, c_{1}} & a_{r_{2}, c_{1}+1} & \cdots & a_{r_{2}, c_{2}} \end{array}\right] .	$\boldsymbol{A}\left(r_{1}: r_{2}, c_{1}: c_{2}\right):=\left[\begin{array}{rrrr} a_{r_{1}, c_{1}} & a_{r_{1}, c_{1}+1} & \cdots & a_{r_{1}, c_{2}} \\ a_{r_{1}+1, c_{1}} & a_{r_{1}+1, c_{1}+1} & \cdots & a_{r_{1}+1, c_{2}} \\ \vdots & \vdots & \ddots & \vdots \\ a_{r_{2}, c_{1}} & a_{r_{2}, c_{1}+1} & \cdots & a_{r_{2}, c_{2}} \end{array}\right] .$	$\boldsymbol{A}\left(r_{1}: r_{2}, c_{1}: c_{2}\right):=\left[\begin{array}{rrrr} a_{r_{1}, c_{1}} & a_{r_{1}, c_{1}+1} & \cdots & a_{r_{1}, c_{2}} \\ a_{r_{1}+1, c_{1}} & a_{r_{1}+1, c_{1}+1} & \cdots & a_{r_{1}+1, c_{2}} \\ \vdots & \vdots & \ddots & \vdots \\ a_{r_{2}, c_{1}} & a_{r_{2}, c_{1}+1} & \cdots & a_{r_{2}, c_{2}} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0247 (4.2)	101	■ 0.998	\boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{[k]} & \boldsymbol{B}_{k}^{*} \\ \boldsymbol{B}_{k} & \boldsymbol{F}_{k} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{L}_{[k]} & \mathbf{0} \\ \boldsymbol{M}_{k} & \boldsymbol{N}_{k} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{D}_{[k]} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{E}_{k} \end{array}\right] \left[\begin{array}{cc} \boldsymbol{L}_{[k]}^{*} & \boldsymbol{M}_{k}^{*} \\ \mathbf{0} & \boldsymbol{N}_{k}^{*} \end{array}\right]=\boldsymbol{L} \boldsymbol{D} \boldsymbol{U},	$\boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{[k]} & \boldsymbol{B}_{k}^{*} \\ \boldsymbol{B}_{k} & \boldsymbol{F}_{k} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{L}_{[k]} & \mathbf{0} \\ \boldsymbol{M}_{k} & \boldsymbol{N}_{k} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{D}_{[k]} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{E}_{k} \end{array}\right] \left[\begin{array}{cc} \boldsymbol{L}_{[k]}^{*} & \boldsymbol{M}_{k}^{*} \\ \mathbf{0} & \boldsymbol{N}_{k}^{*} \end{array}\right]=\boldsymbol{L} \boldsymbol{D} \boldsymbol{U},$	$\boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{[k]} & \boldsymbol{B}_{k}^{*} \\ \boldsymbol{B}_{k} & \boldsymbol{F}_{k} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{L}_{[k]} & \mathbf{0} \\ \boldsymbol{M}_{k} & \boldsymbol{N}_{k} \end{array}\right]\left[\begin{array}{cc} \boldsymbol{D}_{[k]} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{E}_{k} \end{array}\right] \left[\begin{array}{cc} \boldsymbol{L}_{[k]}^{*} & \boldsymbol{M}_{k}^{*} \\ \mathbf{0} & \boldsymbol{N}_{k}^{*} \end{array}\right]=\boldsymbol{L} \boldsymbol{D} \boldsymbol{U},$
lyche-numerical-linear-algebra_EQ0306 (5.13)	125	■ 0.998	\boldsymbol{v}^{*} \boldsymbol{v}=(\boldsymbol{x}-\boldsymbol{y})^{*}(\boldsymbol{x}-\boldsymbol{y})=2 \boldsymbol{x}^{*} \boldsymbol{x}-2 \operatorname{Re} \left(\boldsymbol{y}^{*} \boldsymbol{x}\right)=2 \boldsymbol{v}^{*} \boldsymbol{x} .	$\boldsymbol{v}^{*} \boldsymbol{v}=(\boldsymbol{x}-\boldsymbol{y})^{*}(\boldsymbol{x}-\boldsymbol{y})=2 \boldsymbol{x}^{*} \boldsymbol{x}-2 \operatorname{Re}\left(\boldsymbol{y}^{*} \boldsymbol{x}\right)=2 \boldsymbol{v}^{*} \boldsymbol{x} .$	$\boldsymbol{v}^{*} \boldsymbol{v}=(\boldsymbol{x}-\boldsymbol{y})^{*}(\boldsymbol{x}-\boldsymbol{y})=2 \boldsymbol{x}^{*} \boldsymbol{x}-2 \operatorname{Re}\left(\boldsymbol{y}^{*} \boldsymbol{x}\right)=2 \boldsymbol{v}^{*} \boldsymbol{x} .$
lyche-numerical-linear-algebra_EQ0320	129	■ 0.998	\boldsymbol{A}=\left[\begin{array}{lll} u_{11} & r_{12} & r_{13} \\ u_{21} & u_{22} & r_{23} \\ u_{31} & u_{32} & u_{33} \\ u_{41} & u_{42} & u_{43} \end{array}\right] \text { or } \boldsymbol{A}=\left[\begin{array}{lll} r_{11} & r_{12} & r_{13} \\ u_{21} & r_{22} & r_{23} \\ u_{31} & u_{32} & r_{33} \\ u_{41} & u_{42} & u_{43} \end{array}\right] .	$\boldsymbol{A}=\left[\begin{array}{lll} u_{11} & r_{12} & r_{13} \\ u_{21} & u_{22} & r_{23} \\ u_{31} & u_{32} & u_{33} \\ u_{41} & u_{42} & u_{43} \end{array}\right] \text { or } \boldsymbol{A}=\left[\begin{array}{lll} r_{11} & r_{12} & r_{13} \\ u_{21} & r_{22} & r_{23} \\ u_{31} & u_{32} & r_{33} \\ u_{41} & u_{42} & u_{43} \end{array}\right] .$	$\boldsymbol{A}=\left[\begin{array}{lll} u_{11} & r_{12} & r_{13} \\ u_{21} & u_{22} & r_{23} \\ u_{31} & u_{32} & u_{33} \\ u_{41} & u_{42} & u_{43} \end{array}\right] \text { or } \boldsymbol{A}=\left[\begin{array}{lll} r_{11} & r_{12} & r_{13} \\ u_{21} & r_{22} & r_{23} \\ u_{31} & u_{32} & r_{33} \\ u_{41} & u_{42} & u_{43} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0438	175	■ 0.998	1=\\|z\\|_{2}^{2}=\left\\|\boldsymbol{V}_{1} \boldsymbol{ \Sigma}_{1}^{-1} \boldsymbol{y}\right\\|_{2}^{2}=\left \\|\boldsymbol{\Sigma}_{1}^{-1} \boldsymbol{y}\right \\|_{2}^{2}=\frac{y_{1}^{2}}{\sigma_{1}^{2}}+\cdots+ \frac{y_{n}^{2}}{\sigma_{n}^{2}} .	$1=\\|z\\|_{2}^{2}=\left\\|\boldsymbol{V}_{1} \boldsymbol{ \Sigma}_{1}^{-1} \boldsymbol{y}\right\\|_{2}^{2}=\left \\|\boldsymbol{\Sigma}_{1}^{-1} \boldsymbol{y}\right \\|_{2}^{2}=\frac{y_{1}^{2}}{\sigma_{1}^{2}}+\cdots+ \frac{y_{n}^{2}}{\sigma_{n}^{2}} .$	$1=\\|z\\|_{2}^{2}=\left\\|\boldsymbol{V}_{1} \boldsymbol{ \Sigma}_{1}^{-1} \boldsymbol{y}\right\\|_{2}^{2}=\left \\|\boldsymbol{\Sigma}_{1}^{-1} \boldsymbol{y}\right \\|_{2}^{2}=\frac{y_{1}^{2}}{\sigma_{1}^{2}}+\cdots+ \frac{y_{n}^{2}}{\sigma_{n}^{2}} .$
lyche-numerical-linear-algebra_EQ0477 (8.10)	189	■ 0.998	\left\\|\boldsymbol{A}^{k}\right\\| \leq\\|\boldsymbol{A} \\|^{k} \text { for } \boldsymbol{A} \in \mathbb{C}^{n \times n} \text { and } k \in \mathbb{N} \text {. }	$\left\\|\boldsymbol{A}^{k}\right\\| \leq\\|\boldsymbol{A} \\|^{k} \text { for } \boldsymbol{A} \in \mathbb{C}^{n \times n} \text { and } k \in \mathbb{N} \text {. }$	$\left\\|\boldsymbol{A}^{k}\right\\| \leq\\|\boldsymbol{A} \\|^{k} \text { for } \boldsymbol{A} \in \mathbb{C}^{n \times n} \text { and } k \in \mathbb{N} \text {. }$
lyche-numerical-linear-algebra_EQ0487 (8.17)	191	■ 0.998	\\|\boldsymbol{A}\\|_{p}:=\max _{\boldsymbol{x} \neq 0} \frac{\\|\boldsymbol{A} \boldsymbol{x}\\|_{p}}{\\| \boldsymbol{x}\\|_{p}}=\max _{\\|\boldsymbol{y}\\|_{p}=1}\\| \boldsymbol{A} \boldsymbol{y}\\|_{p} .	$\\|\boldsymbol{A}\\|_{p}:=\max _{\boldsymbol{x} \neq 0} \frac{\\|\boldsymbol{A} \boldsymbol{x}\\|_{p}}{\\|\boldsymbol{x}\\|_{p}}=\max _{\\|\boldsymbol{y}\\|_{p}=1}\\|\boldsymbol{A} \boldsymbol{y}\\|_{p} .$	$\\|\boldsymbol{A}\\|_{p}:=\max _{\boldsymbol{x} \neq 0} \frac{\\|\boldsymbol{A} \boldsymbol{x}\\|_{p}}{\\|\boldsymbol{x}\\|_{p}}=\max _{\\|\boldsymbol{y}\\|_{p}=1}\\|\boldsymbol{A} \boldsymbol{y}\\|_{p} .$
lyche-numerical-linear-algebra_EQ0517 (8.32)	201	■ 0.998	a_{1}^{\lambda_{1}} a_{2}^{\lambda_{2}} \cdots a_{n}^{ \lambda_{n}} \leq \sum_{j=1}^{n} \lambda_{j} a_{j},	$a_{1}^{\lambda_{1}} a_{2}^{\lambda_{2}} \cdots a_{n}^{\lambda_{n}} \leq \sum_{j=1}^{n} \lambda_{j} a_{j},$	$a_{1}^{\lambda_{1}} a_{2}^{\lambda_{2}} \cdots a_{n}^{\lambda_{n}} \leq \sum_{j=1}^{n} \lambda_{j} a_{j},$

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lyche-numerical-linear-algebra_EQ0544	206	0.998	`\boldsymbol{A}=\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right] .`	$\boldsymbol{A} = \left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right] .$	$\boldsymbol{A} = \left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0997	336	0.998	`p_{2}(-M)>0, \quad p_{2}\left(d_{1}\right)<0, \quad p_{2}(+M)>0 .`	$p_{2}(-M)>0, \quad p_{2}\left(d_{1}\right)<0, \quad p_{2}(+M)>0 .$	$p_{2}(-M)>0, \quad p_{2}\left(d_{1}\right)<0, \quad p_{2}(+M)>0 .$
lyche-numerical-linear-algebra_EQ1049	358	0.998	`D_{i} f(\boldsymbol{x}):=\frac{\partial f(\boldsymbol{x})}{\partial x_{i}}:=\lim _{h \rightarrow \mathbf{0}} \frac{f\left(\boldsymbol{x}+h \boldsymbol{e}_{i}\right)-f(\boldsymbol{x})}{h}, \quad \boldsymbol{x} \in \mathbb{R}^{n},`	$D_{i} f(\boldsymbol{x}):=\frac{\partial f(\boldsymbol{x})}{\partial x_{i}}:=\lim _{h \rightarrow \mathbf{0}} \frac{f\left(\boldsymbol{x}+h \boldsymbol{e}_{i}\right)-f(\boldsymbol{x})}{h}, \quad \boldsymbol{x} \in \mathbb{R}^{n},$	$D_{i} f(\boldsymbol{x}):=\frac{\partial f(\boldsymbol{x})}{\partial x_{i}}:=\lim _{h \rightarrow \mathbf{0}} \frac{f\left(\boldsymbol{x}+h \boldsymbol{e}_{i}\right)-f(\boldsymbol{x})}{h}, \quad \boldsymbol{x} \in \mathbb{R}^{n},$
lyche-numerical-linear-algebra_EQ0027 (1.10)	31	0.998	`\langle\boldsymbol{x}, \boldsymbol{y}\rangle:=\boldsymbol{y}^{*} \boldsymbol{x}=\boldsymbol{x}^{T} \overline{\boldsymbol{y}}=\sum_{j=1}^{n} x_{j} \overline{y_{j}} .`	$\langle\boldsymbol{x}, \boldsymbol{y}\rangle:=\boldsymbol{y}^{*} \boldsymbol{x}=\boldsymbol{x}^{T} \overline{\boldsymbol{y}}=\sum_{j=1}^{n} x_{j} \overline{y_{j}} .$	$\langle\boldsymbol{x}, \boldsymbol{y}\rangle:=\boldsymbol{y}^{*} \boldsymbol{x}=\boldsymbol{x}^{T} \overline{\boldsymbol{y}}=\sum_{j=1}^{n} x_{j} \overline{y_{j}} .$
lyche-numerical-linear-algebra_EQ0318 (5.15)	128	0.998	`\begin{aligned} \boldsymbol{A}_{k} & =\left[\begin{array}{ccc|cccc} a_{1,1}^{(1)} & \cdots & a_{1, k-1}^{(1)} & a_{1, k}^{(1)} & \cdots & a_{1, j}^{(1)} & \cdots & a_{1, n}^{(1)} \\ & \ddots & \vdots & \vdots & & \vdots & & \vdots \\ & & a_{k-1, k-1}^{(k-1)} & a_{k-1, k}^{(k-1)} & \cdots & a_{k-1, j}^{(k-1)} & \cdots & a_{k-1, n}^{(k-1)} \\ \hline & & & a_{k, k}^{(k)} & \cdots & a_{k, j}^{(k)} & \cdots & a_{k, n}^{(k)} \\ & & & \vdots & & \vdots & & \vdots \\ & & & a_{i, k}^{(k)} & \cdots & a_{i, j}^{(k)} & \cdots & a_{i, n}^{(k)} \\ & & & \vdots & & \vdots & & \vdots \\ & & & a_{m, k}^{(k)} & \cdots & a_{m, j}^{(k)} & \cdots & a_{m, n}^{(k)} \end{array}\right] \\ & =\left[\begin{array}{cc} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \\ \mathbf{0} & \boldsymbol{D}_{k} \end{array}\right] . \end{aligned}`	$\begin{aligned} \boldsymbol{A}_{k} & =\left[\begin{array}{ccc\|cccc} a_{1,1}^{(1)} & \cdots & a_{1, k-1}^{(1)} & a_{1, k}^{(1)} & \cdots & a_{1, j}^{(1)} & \cdots & a_{1, n}^{(1)} \\ & \ddots & \vdots & \vdots & & \vdots & & \vdots \\ & & a_{k-1, k-1}^{(k-1)} & a_{k-1, k}^{(k-1)} & \cdots & a_{k-1, j}^{(k-1)} & \cdots & a_{k-1, n}^{(k-1)} \\ \hline & & & a_{k, k}^{(k)} & \cdots & a_{k, j}^{(k)} & \cdots & a_{k, n}^{(k)} \\ & & & \vdots & & \vdots & & \vdots \\ & & & a_{i, k}^{(k)} & \cdots & a_{i, j}^{(k)} & \cdots & a_{i, n}^{(k)} \\ & & & \vdots & & \vdots & & \vdots \\ & & & a_{m, k}^{(k)} & \cdots & a_{m, j}^{(k)} & \cdots & a_{m, n}^{(k)} \end{array}\right] \\ & =\left[\begin{array}{cc} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \\ \mathbf{0} & \boldsymbol{D}_{k} \end{array}\right] . \end{aligned}$	$\begin{aligned} \boldsymbol{A}_{k} & =\left[\begin{array}{ccc\|cccc} a_{1,1}^{(1)} & \cdots & a_{1, k-1}^{(1)} & a_{1, k}^{(1)} & \cdots & a_{1, j}^{(1)} & \cdots & a_{1, n}^{(1)} \\ & \ddots & \vdots & \vdots & & \vdots & & \vdots \\ & & a_{k-1, k-1}^{(k-1)} & a_{k-1, k}^{(k-1)} & \cdots & a_{k-1, j}^{(k-1)} & \cdots & a_{k-1, n}^{(k-1)} \\ \hline & & & a_{k, k}^{(k)} & \cdots & a_{k, j}^{(k)} & \cdots & a_{k, n}^{(k)} \\ & & & \vdots & & \vdots & & \vdots \\ & & & a_{i, k}^{(k)} & \cdots & a_{i, j}^{(k)} & \cdots & a_{i, n}^{(k)} \\ & & & \vdots & & \vdots & & \vdots \\ & & & a_{m, k}^{(k)} & \cdots & a_{m, j}^{(k)} & \cdots & a_{m, n}^{(k)} \end{array}\right] \\ & =\left[\begin{array}{cc} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \\ \mathbf{0} & \boldsymbol{D}_{k} \end{array}\right] . \end{aligned}$
lyche-numerical-linear-algebra_EQ0362 (6.1)	147	0.998	`\pi_{A C}(\lambda)=\lambda^{m-n} \pi_{C A}(\lambda), \quad \lambda \in \mathbb{C} .`	$\pi_{A C}(\lambda)=\lambda^{m-n} \pi_{C A}(\lambda), \quad \lambda \in \mathbb{C} .$	$\pi_{A C}(\lambda)=\lambda^{m-n} \pi_{C A}(\lambda), \quad \lambda \in \mathbb{C} .$
lyche-numerical-linear-algebra_EQ0872 (13.28)	303	0.998	`\frac{\left\\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\\|_{\boldsymbol{A}}}{\left\\|\boldsymbol{x}-\boldsymbol{x}_{0}\right\\|_{\boldsymbol{A}}} \leq \min _{\substack{Q \in \Pi_{k} \\ Q(0)=1}} \max _{a \leq x \leq b}|Q(x)|,`	$\frac{\left\\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\\|_{\boldsymbol{A}}}{\left\\|\boldsymbol{x}-\boldsymbol{x}_{0}\right\\|_{\boldsymbol{A}}} \leq \min _{\substack{Q \in \Pi_{k} \\ Q(0)=1}} \max _{a \leq x \leq b}\|Q(x)\|,$	$\frac{\left\\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\\|_{\boldsymbol{A}}}{\left\\|\boldsymbol{x}-\boldsymbol{x}_{0}\right\\|_{\boldsymbol{A}}} \leq \min _{\substack{Q \in \Pi_{k} \\ Q(0)=1}} \max _{a \leq x \leq b}\|Q(x)\|,$

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lyche-numerical-linear-algebra_EQ0611	224	0.998	`\boldsymbol{A}:=\frac{1}{\sqrt{2}}\left[\begin{array}{l} 1 \\ 1 \end{array}\right][2] \frac{1}{\sqrt{2}} \left[\begin{array}{ll} 1 & 1 \end{array}\right], \boldsymbol{A}^{\dagger}=\frac{1}{\sqrt{2}}\left[\begin{array}{l} 1 \\ 1 \end{array}\right]\left[\frac{1}{2}\right] \frac{1}{\sqrt{2}}\left[\begin{array}{ll} 1 & 1 \end{array}\right]=\frac{1}{4} \boldsymbol{A}, \boldsymbol{A}^{\dagger} \boldsymbol{b}= \left[\begin{array}{l} 1 / 2 \\ 1 / 2 \end{array}\right] .`	$\boldsymbol{A}:=\frac{1}{\sqrt{2}}\left[\begin{array}{l} 1 \\ 1 \end{array}\right][2]\frac{1}{\sqrt{2}}\left[\begin{array}{ll} 1 & 1 \end{array}\right], \boldsymbol{A}^{\dagger}=\frac{1}{\sqrt{2}}\left[\begin{array}{l} 1 \\ 1 \end{array}\right]\left[\frac{1}{2}\right]\frac{1}{\sqrt{2}}\left[\begin{array}{ll} 1 & 1 \end{array}\right]=\frac{1}{4}\boldsymbol{A}, \boldsymbol{A}^{\dagger}\boldsymbol{b}=\left[\begin{array}{l} 1/2 \\ 1/2 \end{array}\right].$	$\boldsymbol{A}:=\frac{1}{\sqrt{2}}\left[\begin{array}{l} 1 \\ 1 \end{array}\right][2]\frac{1}{\sqrt{2}}\left[\begin{array}{ll} 1 & 1 \end{array}\right], \boldsymbol{A}^{\dagger}=\frac{1}{\sqrt{2}}\left[\begin{array}{l} 1 \\ 1 \end{array}\right]\left[\frac{1}{2}\right]\frac{1}{\sqrt{2}}\left[\begin{array}{ll} 1 & 1 \end{array}\right]=\frac{1}{4}\boldsymbol{A}, \boldsymbol{A}^{\dagger}\boldsymbol{b}=\left[\begin{array}{l} 1/2 \\ 1/2 \end{array}\right].$
lyche-numerical-linear-algebra_EQ0016 (1.4)	28	0.999	`\mathcal{S}+\mathcal{T}:=\{\boldsymbol{s}+\boldsymbol{t}: \boldsymbol{s} \in \mathcal{S} \text { and } \boldsymbol{t} \in \mathcal{T}\} .`	$\mathcal{S}+\mathcal{T}:=\{\boldsymbol{s}+\boldsymbol{t}: \boldsymbol{s} \in \mathcal{S} \text{ and } \boldsymbol{t} \in \mathcal{T}\}.$	$\mathcal{S}+\mathcal{T}:=\{\boldsymbol{s}+\boldsymbol{t}: \boldsymbol{s} \in \mathcal{S} \text{ and } \boldsymbol{t} \in \mathcal{T}\}.$
lyche-numerical-linear-algebra_EQ0073	44	0.999	`b_{j, k}=\left(\alpha_{k}+\beta_{j}\right) A_{k}\left(-\beta_{j}\right) B_{j}\left(-\alpha_{k}\right),`	$b_{j,k}=\left(\alpha_k+\beta_j\right) A_k\left(-\beta_j\right) B_j\left(-\alpha_k\right),$	$b_{j,k}=(\alpha_k+\beta_j)A_k(-\beta_j)B_j(-\alpha_k),$
lyche-numerical-linear-algebra_EQ0101 (2.18)	55	0.999	`\begin{aligned} \left|u_{k+1}\right| & = \left|d_{k+1}-l_{k} c_{k}\right|=\left|d_{k+1}- \frac{a_{k} c_{k}}{u_{k}}\right| \geq\left|d_{k+1} \right|-\frac{\left|a_{k}\right|\left|c_{k}\right|}{ \left|u_{k}\right|} \\ & \geq\left|d_{k+1}\right|- \left|a_{k}\right|=\sigma_{k+1}+\left|c_{k+1}\right| \end{aligned}`	$\begin{aligned} \left\|u_{k+1}\right\| & = \left\|d_{k+1}-l_{k} c_{k}\right\|=\left\|d_{k+1}- \frac{a_{k} c_{k}}{u_{k}}\right\| \geq\left\|d_{k+1} \right\|-\frac{\left\|a_{k}\right\|\left\|c_{k}\right\|}{ \left\|u_{k}\right\|} \\ & \geq\left\|d_{k+1}\right\|- \left\|a_{k}\right\|=\sigma_{k+1}+\left\|c_{k+1}\right\| \end{aligned}$	$\begin{aligned} \left\|u_{k+1}\right\| & = \left\|d_{k+1}-l_{k} c_{k}\right\|=\left\|d_{k+1}- \frac{a_{k} c_{k}}{u_{k}}\right\| \geq\left\|d_{k+1} \right\|-\frac{\left\|a_{k}\right\|\left\|c_{k}\right\|}{ \left\|u_{k}\right\|} \\ & \geq\left\|d_{k+1}\right\|- \left\|a_{k}\right\|=\sigma_{k+1}+\left\|c_{k+1}\right\| \end{aligned}$
lyche-numerical-linear-algebra_EQ0156	71	0.999	`\delta^{2} f(x):=\frac{f(x+h)-2 f(x)+f(x-h)}{h^{2}}, \quad h>0, \quad f:[x-h, x+h] \rightarrow \mathbb{R} .`	$\delta^2 f(x):=\frac{f(x+h)-2 f(x)+f(x-h)}{h^2}, \quad h>0, \quad f:[x-h, x+h] \rightarrow \mathbb{R}.$	$\delta^2 f(x):=\frac{f(x+h)-2 f(x)+f(x-h)}{h^2}, \quad h>0, \quad f:[x-h, x+h] \rightarrow \mathbb{R}.$
lyche-numerical-linear-algebra_EQ0250	102	0.999	`\left[\begin{array}{ll} 3 & 1 \\ 1 & 3 \end{array} \right]=\left[\begin{array}{cc} 1 & 0 \\ 1 / 3 & 1 \end{array}\right]\left[\begin{array}{cc} 3 & 0 \\ 0 & 8 / 3 \end{array}\right]\left[\begin{array}{cc} 1 & 1 / 3 \\ 0 & 1 \end{array}\right]`	$\left[\begin{array}{ll} 3 & 1 \\ 1 & 3 \end{array}\right]=\left[\begin{array}{ll} 1 & 0 \\ 1/3 & 1 \end{array}\right]\left[\begin{array}{ll} 3 & 0 \\ 0 & 8/3 \end{array}\right]\left[\begin{array}{ll} 1 & 1/3 \\ 0 & 1 \end{array}\right]$	$\left[\begin{array}{ll} 3 & 1 \\ 1 & 3 \end{array}\right]=\left[\begin{array}{ll} 1 & 0 \\ 1/3 & 1 \end{array}\right]\left[\begin{array}{ll} 3 & 0 \\ 0 & 8/3 \end{array}\right]\left[\begin{array}{ll} 1 & 1/3 \\ 0 & 1 \end{array}\right]$
lyche-numerical-linear-algebra_EQ0296 (5.11)	123	0.999	`\left|\boldsymbol{v}-\boldsymbol{s}_{0}\right|<| \boldsymbol{v}-\boldsymbol{s}|, \text { for all } \boldsymbol{s} \in \mathcal{S}, \boldsymbol{s} \neq \boldsymbol{s}_{0} .`	$\left\|\boldsymbol{v}-\boldsymbol{s}_0\right\|<\|\boldsymbol{v}-\boldsymbol{s}\|, \text{ for all } \boldsymbol{s} \in \mathcal{S}, \boldsymbol{s} \neq \boldsymbol{s}_0.$	$\left\|\boldsymbol{v}-\boldsymbol{s}_0\right\|<\|\boldsymbol{v}-\boldsymbol{s}\|, \textit{ for all } \boldsymbol{s} \in \mathcal{S}, \boldsymbol{s} \neq \boldsymbol{s}_0.$
lyche-numerical-linear-algebra_EQ0361	147	0.999	`\begin{aligned} \pi_{\boldsymbol{B}}(\lambda) & =\operatorname{det}\left(\boldsymbol{S}^{-1} \boldsymbol{A} \boldsymbol{S}-\lambda \boldsymbol{I} \right)=\operatorname{det}\left(\boldsymbol{S}^{-1}(\boldsymbol{A}-\lambda \boldsymbol{I}) \boldsymbol{S} \right) \\ & =\operatorname{det}\left(\boldsymbol{S}^{-1} \right) \operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I}) \operatorname{det}(\boldsymbol{S})= \operatorname{det}\left(\boldsymbol{S}^{-1} \boldsymbol{S}\right) \operatorname{det}(\boldsymbol{A}- \lambda \boldsymbol{I})=\pi_{\boldsymbol{A}}(\lambda), \end{aligned}`	$\begin{aligned} \pi_{\boldsymbol{B}}(\lambda) & =\operatorname{det}\left(\boldsymbol{S}^{-1} \boldsymbol{A} \boldsymbol{S}-\lambda \boldsymbol{I}\right)=\operatorname{det}\left(\boldsymbol{S}^{-1}(\boldsymbol{A}-\lambda \boldsymbol{I}) \boldsymbol{S}\right) \\ & =\operatorname{det}\left(\boldsymbol{S}^{-1}\right) \operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I}) \operatorname{det}(\boldsymbol{S})= \operatorname{det}\left(\boldsymbol{S}^{-1} \boldsymbol{S}\right) \operatorname{det}(\boldsymbol{A}- \lambda \boldsymbol{I})=\pi_{\boldsymbol{A}}(\lambda), \end{aligned}$	$\begin{aligned} \pi_{\boldsymbol{B}}(\lambda) & =\operatorname{det}\left(\boldsymbol{S}^{-1} \boldsymbol{A} \boldsymbol{S}-\lambda \boldsymbol{I}\right)=\operatorname{det}\left(\boldsymbol{S}^{-1}(\boldsymbol{A}-\lambda \boldsymbol{I}) \boldsymbol{S}\right) \\ & =\operatorname{det}\left(\boldsymbol{S}^{-1}\right) \operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I}) \operatorname{det}(\boldsymbol{S})= \operatorname{det}\left(\boldsymbol{S}^{-1} \boldsymbol{S}\right) \operatorname{det}(\boldsymbol{A}- \lambda \boldsymbol{I})=\pi_{\boldsymbol{A}}(\lambda), \end{aligned}$

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lyche-numerical-linear-algebra_EQ0381	154	0.999	`e_{i i}=\sum_{k=1}^{n} \bar{b}_{k i} b_{k i}= \sum_{k=1}^{i}\left|b_{k i}\right|^{2} \text { and } f_{i i}=\sum_{k=1}^{n} b_{i k} \bar{b}_{i k}=\sum_{k=i}^{n} \left|b_{i k}\right|^{2} .`	$e_{ii}=\sum_{k=1}^{n} \bar{b}_{ki} b_{ki}=\sum_{k=1}^{i}\left\|b_{ki}\right\|^{2} \text { and } f_{ii}=\sum_{k=1}^{n} b_{ik} \bar{b}_{ik}=\sum_{k=i}^{n} \left\|b_{ik}\right\|^{2} .$	$e_{ii}=\sum_{k=1}^{n} \bar{b}_{ki} b_{ki}=\sum_{k=1}^{i}\left\|b_{ki}\right\|^{2} \text { and } f_{ii}=\sum_{k=1}^{n} b_{ik} \bar{b}_{ik}=\sum_{k=i}^{n} \left\|b_{ik}\right\|^{2} .$
lyche-numerical-linear-algebra_EQ0406	162	0.999	`\boldsymbol{A}=\left[\begin{array}{ccccc} -q_{n-1} & -q_{n-2} & \cdots & -q_{1} & -q_{0} \\ 1 & 0 & \cdots & 0 & 0 \\ 0 & 1 & \cdots & 0 & 0 \\ \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & \cdots & 1 & 0 \end{array} \right] .`	$\boldsymbol{A}=\left[\begin{array}{ccccc} -q_{n-1} & -q_{n-2} & \cdots & -q_{1} & -q_{0} \\ 1 & 0 & \cdots & 0 & 0 \\ 0 & 1 & \cdots & 0 & 0 \\ \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & \cdots & 1 & 0 \end{array} \right] .$	$\boldsymbol{A}=\left[\begin{array}{ccccc} -q_{n-1} & -q_{n-2} & \cdots & -q_{1} & -q_{0} \\ 1 & 0 & \cdots & 0 & 0 \\ 0 & 1 & \cdots & 0 & 0 \\ \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & \cdots & 1 & 0 \end{array} \right] .$
lyche-numerical-linear-algebra_EQ0446 (7.10)	178	0.999	`\boldsymbol{A}:=\left[\begin{array}{ll} 1 & 1 \\ 1 & 1 \end{array}\right]=\frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & 1 \\ 1 & -1 \end{array}\right] \left[\begin{array}{ll} 2 & 0 \\ 0 & 0 \end{array}\right] \frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & 1 \\ 1 & -1 \end{array}\right]=\boldsymbol{U} \boldsymbol{D} \boldsymbol{U}^{T}`	$\boldsymbol{A}:=\left[\begin{array}{ll} 1 & 1 \\ 1 & 1 \end{array}\right]=\frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & 1 \\ 1 & -1 \end{array}\right] \left[\begin{array}{ll} 2 & 0 \\ 0 & 0 \end{array}\right] \frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & 1 \\ 1 & -1 \end{array}\right]=\boldsymbol{U} \boldsymbol{D} \boldsymbol{U}^{T}$	$\boldsymbol{A}:=\left[\begin{array}{ll} 1 & 1 \\ 1 & 1 \end{array}\right]=\frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & 1 \\ 1 & -1 \end{array}\right] \left[\begin{array}{ll} 2 & 0 \\ 0 & 0 \end{array}\right] \frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & 1 \\ 1 & -1 \end{array}\right]=\boldsymbol{U} \boldsymbol{D} \boldsymbol{U}^{T}$
lyche-numerical-linear-algebra_EQ0471 (8.7)	187	0.999	`m|\boldsymbol{x}|^{\prime} \leq|\boldsymbol{x}| \leq M|\boldsymbol{x}|^{\prime} .`	$m\|\boldsymbol{x}\|^{\prime} \leq\|\boldsymbol{x}\| \leq M\|\boldsymbol{x}\|^{\prime} .$	$m\|\boldsymbol{x}\|^{\prime} \leq\|\boldsymbol{x}\| \leq M\|\boldsymbol{x}\|^{\prime} .$
lyche-numerical-linear-algebra_EQ0481 (8.14)	190	0.999	`\mathcal{S}:=\left\{x \in \mathbb{C}^{n}:|\boldsymbol{x}|=1\right\}`	$\mathcal{S}:=\left\{x \in \mathbb{C}^{n}:\|\boldsymbol{x}\|=1\right\}$	$\mathcal{S}:=\left\{x \in \mathbb{C}^{n}:\|\boldsymbol{x}\|=1\right\}$
lyche-numerical-linear-algebra_EQ0538	204	0.999	`|\boldsymbol{x}|_{\boldsymbol{A}}:=\sqrt{ \boldsymbol{x}^{T} \boldsymbol{A} \boldsymbol{x}}, \quad \boldsymbol{x} \in \mathbb{R}^{n} .`	$\|\boldsymbol{x}\|_{\boldsymbol{A}}:=\sqrt{\boldsymbol{x}^{T} \boldsymbol{A} \boldsymbol{x}}, \quad \boldsymbol{x} \in \mathbb{R}^{n} .$	$\|\boldsymbol{x}\|_{\boldsymbol{A}}:=\sqrt{\boldsymbol{x}^{T} \boldsymbol{A} \boldsymbol{x}}, \quad \boldsymbol{x} \in \mathbb{R}^{n} .$
lyche-numerical-linear-algebra_EQ0634	230	0.999	`|\boldsymbol{C}-\boldsymbol{D}|_{F}^{2}=\left| \left[\begin{array}{cc} \mathbf{0} & \boldsymbol{A}-\boldsymbol{B} \\ \boldsymbol{A}^{*}-\boldsymbol{B}^{*} & \mathbf{0} \end{array}\right]\right|_{F}^{2}=| \boldsymbol{B}-\boldsymbol{A}|_{F}^{2}+\left|(\boldsymbol{B}-\boldsymbol{A})^{*}\right|_{F}^{2}=2 |\boldsymbol{B}-\boldsymbol{A}|_{F}^{2} .`	$\|\boldsymbol{C}-\boldsymbol{D}\|_{F}^{2}=\left\|\left[\begin{array}{cc} \mathbf{0} & \boldsymbol{A}-\boldsymbol{B} \\ \boldsymbol{A}^{*}-\boldsymbol{B}^{*} & \mathbf{0} \end{array}\right]\right\|_{F}^{2}=\|\boldsymbol{B}-\boldsymbol{A}\|_{F}^{2}+\left\|(\boldsymbol{B}-\boldsymbol{A})^{*}\right\|_{F}^{2}=2\|\boldsymbol{B}-\boldsymbol{A}\|_{F}^{2} .$	$\|\boldsymbol{C}-\boldsymbol{D}\|_{F}^{2}=\left\|\left[\begin{array}{cc} \mathbf{0} & \boldsymbol{A}-\boldsymbol{B} \\ \boldsymbol{A}^{*}-\boldsymbol{B}^{*} & \mathbf{0} \end{array}\right]\right\|_{F}^{2}=\|\boldsymbol{B}-\boldsymbol{A}\|_{F}^{2}+\left\|(\boldsymbol{B}-\boldsymbol{A})^{*}\right\|_{F}^{2}=2\|\boldsymbol{B}-\boldsymbol{A}\|_{F}^{2} .$
lyche-numerical-linear-algebra_EQ0816	284	0.999	`\frac{1}{4}\left(\lambda^{1 / 2} w_{i-1, j}+\lambda^{1 / 2} w_{i, j-1}+\lambda^{-1 / 2} w_{i+1, j}+\lambda^{-1 / 2} w_{i, j+1}\right)=\mu w_{i, j} .`	$\frac{1}{4}\left(\lambda^{1 / 2} w_{i-1, j}+\lambda^{1 / 2} w_{i, j-1}+\lambda^{-1 / 2} w_{i+1, j}+\lambda^{-1 / 2} w_{i, j+1}\right)=\mu w_{i, j} .$	$\frac{1}{4}\left(\lambda^{1 / 2} w_{i-1, j}+\lambda^{1 / 2} w_{i, j-1}+\lambda^{-1 / 2} w_{i+1, j}+\lambda^{-1 / 2} w_{i, j+1}\right)=\mu w_{i, j} .$
lyche-numerical-linear-algebra_EQ0861	300	0.999	`\kappa_{A}=\frac{5+4 \cos (\pi h)}{5-4 \cos (\pi h)} \leq 9,`	$\kappa_{A}=\frac{5+4 \cos (\pi h)}{5-4 \cos (\pi h)} \leq 9,$	$\kappa_{A}=\frac{5+4 \cos (\pi h)}{5-4 \cos (\pi h)} \leq 9,$
lyche-numerical-linear-algebra_EQ0954 (13.67)	322	0.999	`\left|\boldsymbol{x}^{*}-\boldsymbol{x}\right|_{2} \leq|\boldsymbol{A}|_{2} \min _{\boldsymbol{w} \in \mathcal{W}}\left|\boldsymbol{x}^{*}-\boldsymbol{w} \right|_{2} .`	$\left\|\boldsymbol{x}^{*}-\boldsymbol{x}\right\|_{2} \leq\|\boldsymbol{A}\|_{2} \min _{\boldsymbol{w} \in \mathcal{W}}\left\|\boldsymbol{x}^{*}-\boldsymbol{w} \right\|_{2} .$	$\left\|\boldsymbol{x}^{*}-\boldsymbol{x}\right\|_{2} \leq\|\boldsymbol{A}\|_{2} \min _{\boldsymbol{w} \in \mathcal{W}}\left\|\boldsymbol{x}^{*}-\boldsymbol{w} \right\|_{2} .$

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lyche-numerical-linear-algebra_EQ0208	86	0.999	`\begin{aligned} (\boldsymbol{L} \boldsymbol{U})_{i j} &=\sum_{k=1}^{n} l_{i k}^{(k)} u_{k j}=\sum_{k=1}^{j-1} a_{p_{i}, k}^{(k)} a_{p_{k}, j}^{(k)}+a_{p_{i}, j}^{(k)} a_{p_{j}, j}^{(j)} \\ & =\sum_{k=1}^{j-1}\left(a_{p_{i}, j}^{(k)}-a_{p_{i}, j}^{(k+1)}\right)+a_{p_{i}, j}^{(j)}=a_{p_{i}, j}^{(1)}=a_{p_{i}, j}=a_{p_{i}, j}=\left(\boldsymbol{P}^{T} \boldsymbol{A}\right)_{i j} . \end{aligned}`	$$\begin{aligned} (\boldsymbol{L} \boldsymbol{U})_{i j} &=\sum_{k=1}^{n} l_{i k}^{(k)} u_{k j}=\sum_{k=1}^{j-1} a_{p_{i}, k}^{(k)} a_{p_{k}, j}^{(k)}+a_{p_{i}, j}^{(k)} a_{p_{j}, j}^{(j)} \\ & =\sum_{k=1}^{j-1}\left(a_{p_{i}, j}^{(k)}-a_{p_{i}, j}^{(k+1)}\right)+a_{p_{i}, j}^{(j)}=a_{p_{i}, j}^{(1)}=a_{p_{i}, j}=a_{p_{i}, j}=\left(\boldsymbol{P}^{T} \boldsymbol{A}\right)_{i j} . \end{aligned}$$
lyche-numerical-linear-algebra_EQ0265 (4.9)	109	0.999	`\begin{aligned} 0 \leq \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x} & =\left[-\boldsymbol{y}^{*} \boldsymbol{v} / \alpha, \boldsymbol{y}^{*}\right] \left[\begin{array}{ll} \alpha & \boldsymbol{v}^{*} \\ \boldsymbol{v} & \boldsymbol{B} \end{array} \right]\left[\begin{array}{c} -\boldsymbol{v}^{*} \boldsymbol{y} / \alpha \\ \boldsymbol{y} \end{array} \right] \\ & =\left[0,-\left(\boldsymbol{y}^{*} \boldsymbol{v}\right) \boldsymbol{v}^{*} / \alpha+ \boldsymbol{y}^{*} \boldsymbol{B}\right]\left[\begin{array}{c} -\boldsymbol{v}^{*} \boldsymbol{y} / \alpha \\ \boldsymbol{y} \end{array}\right] \\ & =- \boldsymbol{y}^{*} \boldsymbol{v} \boldsymbol{v}^{*} \boldsymbol{y} / \alpha+\boldsymbol{y}^{*} \boldsymbol{B} \boldsymbol{y}=\boldsymbol{y}^{*} \boldsymbol{C} \boldsymbol{y} . \end{aligned}`	$$\begin{aligned} 0 \leq \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x} & =\left[-\boldsymbol{y}^{*} \boldsymbol{v} / \alpha, \boldsymbol{y}^{*}\right] \left[\begin{array}{ll} \alpha & \boldsymbol{v}^{*} \\ \boldsymbol{v} & \boldsymbol{B} \end{array} \right]\left[\begin{array}{c} -\boldsymbol{v}^{*} \boldsymbol{y} / \alpha \\ \boldsymbol{y} \end{array} \right] \\ & =\left[0,-\left(\boldsymbol{y}^{*} \boldsymbol{v}\right) \boldsymbol{v}^{*} / \alpha+ \boldsymbol{y}^{*} \boldsymbol{B}\right]\left[\begin{array}{c} -\boldsymbol{v}^{*} \boldsymbol{y} / \alpha \\ \boldsymbol{y} \end{array}\right] \\ & =- \boldsymbol{y}^{*} \boldsymbol{v} \boldsymbol{v}^{*} \boldsymbol{y} / \alpha+\boldsymbol{y}^{*} \boldsymbol{B} \boldsymbol{y}=\boldsymbol{y}^{*} \boldsymbol{C} \boldsymbol{y} . \end{aligned}$$
lyche-numerical-linear-algebra_EQ0309	126	0.999	`\begin{gathered} \boldsymbol{H}:=\boldsymbol{I}-\frac{2 \boldsymbol{v} \boldsymbol{v}^{T}}{\boldsymbol{v}^{T} \boldsymbol{v}}=\left[\begin{array}{lll} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array}\right]-\frac{2}{4}\left[\begin{array}{l} 2 \\ 0 \\ 0 \end{array}\right]\left[\begin{array}{lll} 2 & 0 & 0 \end{array}\right]=\left[\begin{array}{ccc} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array}\right], \\ \boldsymbol{P}:=\boldsymbol{I}-\frac{\boldsymbol{v} \boldsymbol{v}^{T}}{\boldsymbol{v}^{T} \boldsymbol{v}}= \left[\begin{array}{lll} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array}\right]-\frac{1}{4}\left[\begin{array}{l} 2 \\ 0 \\ 0 \end{array}\right]\left[\begin{array}{lll} 2 & 0 & 0 \end{array}\right]=\left[\begin{array}{lll} 0 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array}\right] . \end{gathered}`	$$\begin{gathered} \boldsymbol{H}:=\boldsymbol{I}-\frac{2 \boldsymbol{v} \boldsymbol{v}^{T}}{\boldsymbol{v}^{T} \boldsymbol{v}}=\left[\begin{array}{lll} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array}\right]-\frac{2}{4}\left[\begin{array}{l} 2 \\ 0 \\ 0 \end{array}\right]\left[\begin{array}{lll} 2 & 0 & 0 \end{array}\right]=\left[\begin{array}{ccc} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array}\right], \\ \boldsymbol{P}:=\boldsymbol{I}-\frac{\boldsymbol{v} \boldsymbol{v}^{T}}{\boldsymbol{v}^{T} \boldsymbol{v}}= \left[\begin{array}{lll} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array}\right]-\frac{1}{4}\left[\begin{array}{l} 2 \\ 0 \\ 0 \end{array}\right]\left[\begin{array}{lll} 2 & 0 & 0 \end{array}\right]=\left[\begin{array}{lll} 0 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array}\right] . \end{gathered}$$

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lyche-numerical-linear-algebra_EQ0645	232	0.999	`\begin{aligned} B & =(B A) B=\left(A^{*}\right) B^{*} B= \left(A^{*} C^{*}\right) A^{*} B^{*} B=C A\left(A^{*} B^{*}\right) B \\ & =C A(B A B)=(C) A B=C(A C) A B=C C^{*} A^{*}(A B) \\ & =C C^{*}\left(A^{*} B^{*} A^{*} \right)=C\left(C^{*} A^{*}\right)=C A C=C . \end{aligned}`	$\begin{aligned} B &= (BA)B = (A^*)\,B^*B = (A^*C^*)\,A^*B^*B = CA\,(A^*B^*)\,B \\ &= CA(BAB) = (C)AB = C(AC)AB = CC^*A^*(AB) \\ &= CC^*\,(A^*B^*A^*) = C\,(C^*A^*) = CAC = C. \end{aligned}$	$\begin{aligned} \boldsymbol{B} &= (\boldsymbol{B}\boldsymbol{A})\boldsymbol{B} = (\boldsymbol{A}^*)\boldsymbol{B}^*\boldsymbol{B} = (\boldsymbol{A}^*\boldsymbol{C}^*)\boldsymbol{A}^*\boldsymbol{B}^*\boldsymbol{B} = \boldsymbol{C}\boldsymbol{A}(\boldsymbol{A}^*\boldsymbol{B}^*)\boldsymbol{B} \\ &= \boldsymbol{C}\boldsymbol{A}(\boldsymbol{B}\boldsymbol{A}\boldsymbol{B}) = (\boldsymbol{C})\boldsymbol{A}\boldsymbol{B} = \boldsymbol{C}(\boldsymbol{A}\boldsymbol{C})\boldsymbol{A}\boldsymbol{B} = \boldsymbol{C}\boldsymbol{C}^*\boldsymbol{A}^*(\boldsymbol{A}\boldsymbol{B}) \\ &= \boldsymbol{C}\boldsymbol{C}^*(\boldsymbol{A}^*\boldsymbol{B}^*\boldsymbol{A}^*) = \boldsymbol{C}(\boldsymbol{C}^*\boldsymbol{A}^*) = \boldsymbol{C}\boldsymbol{A}\boldsymbol{C} = \boldsymbol{C}. \end{aligned}$
lyche-numerical-linear-algebra_EQ0827	287	0.999	`\boldsymbol{x}:=\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right]=\left[\begin{array}{ll} 0 & a \\ a & 0 \end{array}\right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right]+\left[\begin{array}{l} 1-a \\ 1-a \end{array}\right]=: \boldsymbol{G} \boldsymbol{x}+ \boldsymbol{c} .`	$\boldsymbol{x} := \left[\begin{array}{l} x_1 \\ x_2 \end{array}\right] = \left[\begin{array}{ll} 0 & a \\ a & 0 \end{array}\right] \left[\begin{array}{l} x_1 \\ x_2 \end{array}\right] + \left[\begin{array}{l} 1-a \\ 1-a \end{array}\right] =: \boldsymbol{G}\boldsymbol{x} + \boldsymbol{c}.$	$\boldsymbol{x} := \left[\begin{array}{l} x_1 \\ x_2 \end{array}\right] = \left[\begin{array}{ll} 0 & a \\ a & 0 \end{array}\right] \left[\begin{array}{l} x_1 \\ x_2 \end{array}\right] + \left[\begin{array}{l} 1-a \\ 1-a \end{array}\right] =: \boldsymbol{G}\boldsymbol{x} + \boldsymbol{c}.$
lyche-numerical-linear-algebra_EQ0942	319	0.999	`\mathbb{W}_{k}:=\operatorname{span}\left( \boldsymbol{b}, \boldsymbol{A} \boldsymbol{b}, \ldots, \boldsymbol{A}^{k-1} \boldsymbol{b}\right) .`	$\mathbb{W}_k := \operatorname{span}\left(\boldsymbol{b}, \boldsymbol{A}\boldsymbol{b}, \ldots, \boldsymbol{A}^{k-1}\boldsymbol{b}\right).$	$\mathbb{W}_k := \operatorname{span}(\boldsymbol{b}, \boldsymbol{A}\boldsymbol{b}, \ldots, \boldsymbol{A}^{k-1}\boldsymbol{b}).$
lyche-numerical-linear-algebra_EQ0062 (1.21)	41	0.999	`\overline{\boldsymbol{C}}=\boldsymbol{C}\left( \boldsymbol{I}+\frac{1}{\lambda} \boldsymbol{e}_{i}\left( \boldsymbol{e}_{i}^{T}-\boldsymbol{a}^{T} \boldsymbol{C} \right)\right)`	$\overline{\boldsymbol{C}} = \boldsymbol{C}\left(\boldsymbol{I} + \frac{1}{\lambda}\boldsymbol{e}_i\left(\boldsymbol{e}_i^T - \boldsymbol{a}^T\boldsymbol{C}\right)\right)$	$\overline{\boldsymbol{C}} = \boldsymbol{C}\big(\boldsymbol{I} + \frac{1}{\lambda}\boldsymbol{e}_i(\boldsymbol{e}_i^T - \boldsymbol{a}^T\boldsymbol{C})\big)$
lyche-numerical-linear-algebra_EQ0202 (3.12)	85	0.999	`\boldsymbol{P}^{T}=\boldsymbol{P}_{n-1} \cdots \boldsymbol{P}_{1}=\boldsymbol{I}(\boldsymbol{p},:), \quad \boldsymbol{P}=\boldsymbol{P}_{1} \boldsymbol{P}_{2} \cdots \boldsymbol{P}_{n-1}= \boldsymbol{I}(:, \boldsymbol{p}) .`	$\boldsymbol{P}^T = \boldsymbol{P}_{n-1}\cdots\boldsymbol{P}_1 = \boldsymbol{I}(\boldsymbol{p},:), \quad \boldsymbol{P} = \boldsymbol{P}_1\boldsymbol{P}_2\cdots\boldsymbol{P}_{n-1} = \boldsymbol{I}(:,\boldsymbol{p}).$	$\boldsymbol{P}^T = \boldsymbol{P}_{n-1}\cdots\boldsymbol{P}_1 = \boldsymbol{I}(\boldsymbol{p},:), \quad \boldsymbol{P} = \boldsymbol{P}_1\boldsymbol{P}_2\cdots\boldsymbol{P}_{n-1} = \boldsymbol{I}(:,\boldsymbol{p}).$
lyche-numerical-linear-algebra_EQ0254	104	0.999	`\begin{aligned} \boldsymbol{x}^{T} \boldsymbol{T} \boldsymbol{x} & =2 \sum_{i=1}^{n} x_{i}^{2}- \sum_{i=1}^{n-1} x_{i} x_{i+1}-\sum_{i=2}^{n} x_{i-1} x_{i} \\ & =\sum_{i=1}^{n-1} x_{i}^{2}-2 \sum_{i=1}^{n-1} x_{i} x_{i+1}+\sum_{i=1}^{n-1} x_{i+1}^{2}+x_{1}^{2}+x_{n}^{2} \\ & =x_{1}^{2}+x_{n}^{2}+\sum_{i=1}^{n-1}\left(x_{i+1}-x_{i} \right)^{2} . \end{aligned}`	$\begin{aligned} \boldsymbol{x}^T\boldsymbol{T}\boldsymbol{x} &= 2\sum_{i=1}^{n} x_i^2 - \sum_{i=1}^{n-1} x_i x_{i+1} - \sum_{i=2}^{n} x_{i-1}x_i \\ &= \sum_{i=1}^{n-1} x_i^2 - 2\sum_{i=1}^{n-1} x_i x_{i+1} + \sum_{i=1}^{n-1} x_{i+1}^2 + x_1^2 + x_n^2 \\ &= x_1^2 + x_n^2 + \sum_{i=1}^{n-1}\left(x_{i+1} - x_i\right)^2. \end{aligned}$	$\begin{aligned} \boldsymbol{x}^T\boldsymbol{T}\boldsymbol{x} &= 2\sum_{i=1}^{n} x_i^2 - \sum_{i=1}^{n-1} x_i x_{i+1} - \sum_{i=2}^{n} x_{i-1}x_i \\ &= \sum_{i=1}^{n-1} x_i^2 - 2\sum_{i=1}^{n-1} x_i x_{i+1} + \sum_{i=1}^{n-1} x_{i+1}^2 + x_1^2 + x_n^2 \\ &= x_1^2 + x_n^2 + \sum_{i=1}^{n-1}(x_{i+1} - x_i)^2. \end{aligned}$
lyche-numerical-linear-algebra_EQ0286	119	0.999	`\\|\boldsymbol{x}+\boldsymbol{y}\\|^{2} \leq\\| \boldsymbol{x}\\|^{2}+2\\|\boldsymbol{x}\\|\\|\boldsymbol{y} \\|+\\|\boldsymbol{y}\\|^{2}=(\\|\boldsymbol{x}\\|+\\| \boldsymbol{y}\\|)^{2} .`	$\\|\boldsymbol{x}+\boldsymbol{y}\\|^2 \leq \\|\boldsymbol{x}\\|^2 + 2\\|\boldsymbol{x}\\|\\|\boldsymbol{y}\\| + \\|\boldsymbol{y}\\|^2 = (\\|\boldsymbol{x}\\| + \\|\boldsymbol{y}\\|)^2.$	$\\|\boldsymbol{x}+\boldsymbol{y}\\|^2 \leq \\|\boldsymbol{x}\\|^2 + 2\\|\boldsymbol{x}\\|\\|\boldsymbol{y}\\| + \\|\boldsymbol{y}\\|^2 = (\\|\boldsymbol{x}\\| + \\|\boldsymbol{y}\\|)^2.$
lyche-numerical-linear-algebra_EQ0310	126	0.999	`\mathcal{M}:=\left\{\boldsymbol{w} \in \mathbb{R}^{3}: \boldsymbol{w}^{T} \boldsymbol{v}=0\right\}=\left\{\left[ \begin{array}{l} w_{1} \\ w_{2} \\ w_{3} \end{array} \right]: 2 w_{1}=0\right\}`	$\mathcal{M} := \left\{\boldsymbol{w} \in \mathbb{R}^3 : \boldsymbol{w}^T\boldsymbol{v} = 0\right\} = \left\{\left[\begin{array}{l} w_1 \\ w_2 \\ w_3 \end{array}\right] : 2w_1 = 0\right\}$	$\mathcal{M} := \{\boldsymbol{w} \in \mathbb{R}^3 : \boldsymbol{w}^T\boldsymbol{v} = 0\} = \{\left[\begin{array}{l} w_1 \\ w_2 \\ w_3 \end{array}\right] : 2w_1 = 0\}$

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lyche-numerical-linear-algebra_EQ0348	141	0.999	`\left[\begin{array}{ll} p_{i i} & p_{i j} \\ p_{j i} & p_{j j} \end{array}\right]=\left[\begin{array}{cc} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{array}\right],`	$\left[\begin{array}{ll} p_{i i} & p_{i j} \\ p_{j i} & p_{j j} \end{array}\right]=\left[\begin{array}{cc} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{array}\right],$	$\left[\begin{array}{ll} p_{i i} & p_{i j} \\ p_{j i} & p_{j j} \end{array}\right]=\left[\begin{array}{cc} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{array}\right],$
lyche-numerical-linear-algebra_EQ0412 (6.20)	165	0.999	`\boldsymbol{x}=\sum_{j=1}^{n} c_{j} \boldsymbol{u}_{j}, \quad \boldsymbol{A} \boldsymbol{x}=\sum_{j=1}^{n} c_{j} \lambda_{j} \boldsymbol{u}_{j}, \text { where } c_{j}=\frac{\boldsymbol{u}_{j}^{*} \boldsymbol{x}}{ \boldsymbol{u}_{j}^{*} \boldsymbol{u}_{j}} .`	$\boldsymbol{x}=\sum_{j=1}^{n} c_{j} \boldsymbol{u}_{j}, \quad \boldsymbol{A} \boldsymbol{x}=\sum_{j=1}^{n} c_{j} \lambda_{j} \boldsymbol{u}_{j}, \text { where } c_{j}=\frac{\boldsymbol{u}_{j}^{*} \boldsymbol{x}}{ \boldsymbol{u}_{j}^{*} \boldsymbol{u}_{j}} .$	$\boldsymbol{x}=\sum_{j=1}^{n} c_{j} \boldsymbol{u}_{j}, \quad \boldsymbol{A} \boldsymbol{x}=\sum_{j=1}^{n} c_{j} \lambda_{j} \boldsymbol{u}_{j}, \text { where } c_{j}=\frac{\boldsymbol{u}_{j}^{*} \boldsymbol{x}}{ \boldsymbol{u}_{j}^{*} \boldsymbol{u}_{j}} .$
lyche-numerical-linear-algebra_EQ0440	176	0.999	`\frac{\left(\frac{3}{5} x_{1}+\frac{4}{5} x_{2} \right)^{2}}{9}+\frac{\left(-\frac{4}{5} x_{1}+ \frac{3}{5} x_{2}\right)^{2}}{1}=1,`	$\frac{\left(\frac{3}{5} x_{1}+\frac{4}{5} x_{2} \right)^{2}}{9}+\frac{\left(-\frac{4}{5} x_{1}+ \frac{3}{5} x_{2}\right)^{2}}{1}=1,$	$\frac{\left(\frac{3}{5} x_{1}+\frac{4}{5} x_{2} \right)^{2}}{9}+\frac{\left(-\frac{4}{5} x_{1}+ \frac{3}{5} x_{2}\right)^{2}}{1}=1,$
lyche-numerical-linear-algebra_EQ0499	195	0.999	`x_{1}+\left(1+10^{-16}\right) x_{2}=20-10^{-15},`	$x_{1}+\left(1+10^{-16}\right) x_{2}=20-10^{-15},$	$x_{1}+\left(1+10^{-16}\right) x_{2}=20-10^{-15},$
lyche-numerical-linear-algebra_EQ0510	198	0.999	`\left|\boldsymbol{B}^{-1}\right| \leq\left| \boldsymbol{A}^{-1}\right|+\left|\boldsymbol{A}^{-1} \boldsymbol{E} \boldsymbol{B}^{-1}\right| \leq\left| \boldsymbol{A}^{-1}\right|+r\left|\boldsymbol{B}^{-1} \right| .`	$\left\|\boldsymbol{B}^{-1}\right\| \leq\left\|\boldsymbol{A}^{-1}\right\|+\left\|\boldsymbol{A}^{-1} \boldsymbol{E} \boldsymbol{B}^{-1}\right\| \leq\left\|\boldsymbol{A}^{-1}\right\|+r\left\|\boldsymbol{B}^{-1}\right\| .$	$\left\|\boldsymbol{B}^{-1}\right\| \leq\left\|\boldsymbol{A}^{-1}\right\|+\left\|\boldsymbol{A}^{-1} \boldsymbol{E} \boldsymbol{B}^{-1}\right\| \leq\left\|\boldsymbol{A}^{-1}\right\|+r\left\|\boldsymbol{B}^{-1}\right\| .$
lyche-numerical-linear-algebra_EQ0559	209	0.999	`K(\boldsymbol{B})^{-1} \frac{\\|\boldsymbol{E}\\|}{\\| \boldsymbol{A}\\|} \leq \frac{\left|\boldsymbol{B}^{-1}- \boldsymbol{A}^{-1}\right|}{\left|\boldsymbol{B}^{-1} \right|} .`	$K(\boldsymbol{B})^{-1} \frac{\\|\boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|} \leq \frac{\left\|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}\right\|}{\left\|\boldsymbol{B}^{-1}\right\|} .$	$K(\boldsymbol{B})^{-1} \frac{\\|\boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|} \leq \frac{\left\|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}\right\|}{\left\|\boldsymbol{B}^{-1}\right\|} .$
lyche-numerical-linear-algebra_EQ0617 (9.14)	226	0.999	`\frac{1}{4} 10^{-2} \leq \frac{\\|\boldsymbol{y}- \boldsymbol{x}\\|_{\infty}}{\\|\boldsymbol{x}\\|_{\infty}} \leq 4 \cdot 10^{-2} .`	$\frac{1}{4} 10^{-2} \leq \frac{\\|\boldsymbol{y}-\boldsymbol{x}\\|_{\infty}}{\\|\boldsymbol{x}\\|_{\infty}} \leq 4 \cdot 10^{-2} .$	$\frac{1}{4} 10^{-2} \leq \frac{\\|\boldsymbol{y}-\boldsymbol{x}\\|_{\infty}}{\\|\boldsymbol{x}\\|_{\infty}} \leq 4 \cdot 10^{-2} .$
lyche-numerical-linear-algebra_EQ0661 (10.5)	239	0.999	`\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}=h^{2} \boldsymbol{F} \quad \text { with } \quad h=1 /(m+1),`	$\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}=h^{2} \boldsymbol{F} \quad \text { with } \quad h=1 /(m+1),$	$\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}=h^{2} \boldsymbol{F} \quad \text { with } \quad h=1 /(m+1),$
lyche-numerical-linear-algebra_EQ0723	258	0.999	`\boldsymbol{D}_{2}=\operatorname{diag}\left(1, \omega_{4} \right)=\left[\begin{array}{rr} 1 & 0 \\ 0 & -i \end{array}\right] .`	$\boldsymbol{D}_{2}=\operatorname{diag}\left(1, \omega_{4} \right)=\left[\begin{array}{rr} 1 & 0 \\ 0 & -i \end{array}\right] .$	$\boldsymbol{D}_{2}=\operatorname{diag}\left(1, \omega_{4} \right)=\left[\begin{array}{rr} 1 & 0 \\ 0 & -i \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0846	293	0.999	`\begin{aligned} & \boldsymbol{t}_{0}=3\left[\begin{array}{c} 1 \\ -1 / 2 \end{array}\right], \quad \alpha_{0}=\frac{1}{2}, \quad \boldsymbol{x}_{1}=-4^{-1} \left[\begin{array}{l} 1 \\ 2 \end{array}\right], \quad \boldsymbol{r}_{1}=3 * 4^{-1}\left[\begin{array}{l} 0 \ \ 1 \end{array}\right] \\ & \boldsymbol{t}_{1}=3 * 4^{-1} \left[\begin{array}{c} -1 \\ 2 \end{array}\right], \quad \alpha_{1}=\frac{1}{2}, \quad \boldsymbol{x}_{2}=-4^{-1} \left[\begin{array}{c} 1 \\ 1 / 2 \end{array}\right], \quad \boldsymbol{r}_{2}=3 * 4^{-1}\left[\begin{array}{c} 1 / 2 \\ 0 \end{array}\right], \end{aligned}`	$\begin{aligned} & \boldsymbol{t}_{0}=3\left[\begin{array}{c} 1 \\ -1 / 2 \end{array}\right], \quad \alpha_{0}=\frac{1}{2}, \quad \boldsymbol{x}_{1}=-4^{-1}\left[\begin{array}{l} 1 \\ 2 \end{array}\right], \quad \boldsymbol{r}_{1}=3 * 4^{-1}\left[\begin{array}{l} 0 \\ 1 \end{array}\right] \\ & \boldsymbol{t}_{1}=3 * 4^{-1}\left[\begin{array}{c} -1 \\ 2 \end{array}\right], \quad \alpha_{1}=\frac{1}{2}, \quad \boldsymbol{x}_{2}=-4^{-1}\left[\begin{array}{c} 1 \\ 1 / 2 \end{array}\right], \quad \boldsymbol{r}_{2}=3 * 4^{-1}\left[\begin{array}{c} 1 / 2 \\ 0 \end{array}\right], \end{aligned}$	$\begin{aligned} & \boldsymbol{t}_{0}=3\left[\begin{array}{c} 1 \\ -1 / 2 \end{array}\right], \quad \alpha_{0}=\frac{1}{2}, \quad \boldsymbol{x}_{1}=-4^{-1}\left[\begin{array}{l} 1 \\ 2 \end{array}\right], \quad \boldsymbol{r}_{1}=3 * 4^{-1}\left[\begin{array}{l} 0 \\ 1 \end{array}\right] \\ & \boldsymbol{t}_{1}=3 * 4^{-1}\left[\begin{array}{c} -1 \\ 2 \end{array}\right], \quad \alpha_{1}=\frac{1}{2}, \quad \boldsymbol{x}_{2}=-4^{-1}\left[\begin{array}{c} 1 \\ 1 / 2 \end{array}\right], \quad \boldsymbol{r}_{2}=3 * 4^{-1}\left[\begin{array}{c} 1 / 2 \\ 0 \end{array}\right], \end{aligned}$

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lyche-numerical-linear-algebra_EQ0899 (13.40)	308	0.999	`\frac{\left|\boldsymbol{\epsilon}_{k+1}\right|_{ \boldsymbol{A}}^{2}}{\left|\boldsymbol{\epsilon}_{k} \right|_{\boldsymbol{A}}^{2}} \leq\left(\frac{\kappa-1}{ \kappa+1}\right)^{2}, \quad k=0,1,2, \ldots,`	$\frac{\left\|\boldsymbol{\epsilon}_{k+1}\right\|_{\boldsymbol{A}}^{2}}{\left\|\boldsymbol{\epsilon}_{k}\right\|_{\boldsymbol{A}}^{2}} \leq\left(\frac{\kappa-1}{\kappa+1}\right)^{2}, \quad k=0,1,2, \ldots,$	$\frac{\left\|\boldsymbol{\epsilon}_{k+1}\right\|_{\boldsymbol{A}}^{2}}{\left\|\boldsymbol{\epsilon}_{k}\right\|_{\boldsymbol{A}}^{2}} \leq\left(\frac{\kappa-1}{\kappa+1}\right)^{2}, \quad k=0,1,2, \ldots,$
lyche-numerical-linear-algebra_EQ0937	317	0.999	`c_{0}\left(x^{T} \boldsymbol{A}_{p} x\right) \leq x^{T} \boldsymbol{A} \boldsymbol{x} \leq c_{1}\left(x^{T} \boldsymbol{A}_{p} x\right)`	$c_{0}\left(x^{T} \boldsymbol{A}_{p} x\right) \leq x^{T} \boldsymbol{A} \boldsymbol{x} \leq c_{1}\left(x^{T} \boldsymbol{A}_{p} x\right)$	$c_{0}\left(x^{T} \boldsymbol{A}_{p} x\right) \leq x^{T} \boldsymbol{A} \boldsymbol{x} \leq c_{1}\left(x^{T} \boldsymbol{A}_{p} x\right)$
lyche-numerical-linear-algebra_EQ0945	320	0.999	`\boldsymbol{A} \boldsymbol{p}_{k-1} \in \operatorname{span}\left(\boldsymbol{p}_{k-2}, \boldsymbol{p}_{k-1}, \boldsymbol{p}_{k}\right) .`	$\boldsymbol{A} \boldsymbol{p}_{k-1} \in \operatorname{span}\left(\boldsymbol{p}_{k-2}, \boldsymbol{p}_{k-1}, \boldsymbol{p}_{k}\right) .$	$\boldsymbol{A} \boldsymbol{p}_{k-1} \in \operatorname{span}\left(\boldsymbol{p}_{k-2}, \boldsymbol{p}_{k-1}, \boldsymbol{p}_{k}\right) .$
lyche-numerical-linear-algebra_EQ0960 (13.69)	323	0.999	`\begin{aligned} & \boldsymbol{x}_{k+1}=\left(1-\omega_{k}\right) \boldsymbol{x}_{k-1}+\omega_{k} \left(\boldsymbol{x}_{k}+\boldsymbol{r}_{k}\right), \\ & \boldsymbol{r}_{k+1}=\left(1-\omega_{k}\right) \boldsymbol{r}_{k-1}+\omega_{k} \boldsymbol{B} \boldsymbol{r}_{k}, \end{aligned}`	$\begin{aligned} & \boldsymbol{x}_{k+1}=\left(1-\omega_{k}\right) \boldsymbol{x}_{k-1}+\omega_{k} \left(\boldsymbol{x}_{k}+\boldsymbol{r}_{k}\right), \\ & \boldsymbol{r}_{k+1}=\left(1-\omega_{k}\right) \boldsymbol{r}_{k-1}+\omega_{k} \boldsymbol{B} \boldsymbol{r}_{k}, \end{aligned}$	$\begin{aligned} & \boldsymbol{x}_{k+1}=\left(1-\omega_{k}\right) \boldsymbol{x}_{k-1}+\omega_{k} \left(\boldsymbol{x}_{k}+\boldsymbol{r}_{k}\right), \\ & \boldsymbol{r}_{k+1}=\left(1-\omega_{k}\right) \boldsymbol{r}_{k-1}+\omega_{k} \boldsymbol{B} \boldsymbol{r}_{k}, \end{aligned}$
lyche-numerical-linear-algebra_EQ0986	332	0.999	`\frac{1}{\lambda} \leq\left|\boldsymbol{A}^{-1}\right|_{p}=\frac{K_{p}(\boldsymbol{A})}{|\boldsymbol{A}|_{p}}`	$\frac{1}{\lambda} \leq\left\|\boldsymbol{A}^{-1}\right\|_{p}=\frac{K_{p}(\boldsymbol{A})}{\|\boldsymbol{A}\|_{p}}$	$\frac{1}{\lambda} \leq\left\|\boldsymbol{A}^{-1}\right\|_{p}=\frac{K_{p}(\boldsymbol{A})}{\|\boldsymbol{A}\|_{p}}$
lyche-numerical-linear-algebra_EQ1025	346	0.999	`\boldsymbol{x}_{k}=\frac{\boldsymbol{z}_{k}}{ \left|\boldsymbol{z}_{k}\right|}=\frac{c_{1} \lambda_{1}^{k}}{\left|c_{1} \lambda_{1}^{k}\right|} \frac{\boldsymbol{v}_{1}+\frac{c_{2}}{c_{1}}\left(\frac{ \lambda_{2}}{\lambda_{1}}\right)^{k} \boldsymbol{v}_{2}+ \cdots+\frac{c_{n}}{c_{1}}\left(\frac{\lambda_{n}}{ \lambda_{1}}\right)^{k} \boldsymbol{v}_{n}}{\left| \boldsymbol{v}_{1}+\frac{c_{2}}{c_{1}}\left(\frac{ \lambda_{2}}{\lambda_{1}}\right)^{k} \boldsymbol{v}_{2}+ \cdots+\frac{c_{n}}{c_{1}}\left(\frac{\lambda_{n}}{ \lambda_{1}}\right)^{k} \boldsymbol{v}_{n}\right|}, \quad k=0,1,2, \ldots,`	$\boldsymbol{x}_{k}=\frac{\boldsymbol{z}_{k}}{\left\|\boldsymbol{z}_{k}\right\|}=\frac{c_{1} \lambda_{1}^{k}}{\left\|c_{1} \lambda_{1}^{k}\right\|} \frac{\boldsymbol{v}_{1}+\frac{c_{2}}{c_{1}}\left(\frac{\lambda_{2}}{\lambda_{1}}\right)^{k} \boldsymbol{v}_{2}+\cdots+\frac{c_{n}}{c_{1}}\left(\frac{\lambda_{n}}{\lambda_{1}}\right)^{k} \boldsymbol{v}_{n}}{\left\|\boldsymbol{v}_{1}+\frac{c_{2}}{c_{1}}\left(\frac{\lambda_{2}}{\lambda_{1}}\right)^{k} \boldsymbol{v}_{2}+\cdots+\frac{c_{n}}{c_{1}}\left(\frac{\lambda_{n}}{\lambda_{1}}\right)^{k} \boldsymbol{v}_{n}\right\|}, \quad k=0,1,2, \ldots,$	$\boldsymbol{x}_{k}=\frac{\boldsymbol{z}_{k}}{\left\|\boldsymbol{z}_{k}\right\|}=\frac{c_{1} \lambda_{1}^{k}}{\left\|c_{1} \lambda_{1}^{k}\right\|} \frac{\boldsymbol{v}_{1}+\frac{c_{2}}{c_{1}}\left(\frac{\lambda_{2}}{\lambda_{1}}\right)^{k} \boldsymbol{v}_{2}+\cdots+\frac{c_{n}}{c_{1}}\left(\frac{\lambda_{n}}{\lambda_{1}}\right)^{k} \boldsymbol{v}_{n}}{\left\|\boldsymbol{v}_{1}+\frac{c_{2}}{c_{1}}\left(\frac{\lambda_{2}}{\lambda_{1}}\right)^{k} \boldsymbol{v}_{2}+\cdots+\frac{c_{n}}{c_{1}}\left(\frac{\lambda_{n}}{\lambda_{1}}\right)^{k} \boldsymbol{v}_{n}\right\|}, \quad k=0,1,2, \ldots,$
lyche-numerical-linear-algebra_EQ1034	349	0.999	`\begin{aligned} & s_{k}=\frac{\boldsymbol{y}_{k}^{*} \boldsymbol{A} \boldsymbol{y}_{k}}{\boldsymbol{y}_{k}^{*} \boldsymbol{y}_{k}}=s_{k-1}+\frac{\boldsymbol{y}_{k}^{*} \left(\boldsymbol{A}-s_{k-1} \boldsymbol{I} \right) \boldsymbol{y}_{k}}{\boldsymbol{y}_{k}^{*} \boldsymbol{y}_{k}}=s_{k-1}+\frac{\boldsymbol{y}_{k}^{*} \boldsymbol{x}_{k-1}}{\boldsymbol{y}_{k}^{*} \boldsymbol{y}_{k}}=s_{k-1}+\rho_{k}, \\ & \boldsymbol{r}_{k}=\boldsymbol{A} \boldsymbol{x}_{k}-s_{k} \boldsymbol{x}_{k}=\frac{\boldsymbol{A} \boldsymbol{y}_{k}-\left(s_{k-1}+\rho_{k} \right) \boldsymbol{y}_{k}}{\left|\boldsymbol{y}_{k}\right|_{2}}=\frac{\boldsymbol{x}_{k-1}-\rho_{k} \boldsymbol{y}_{k}}{\left|\boldsymbol{y}_{k}\right|_{2}}=\boldsymbol{w}_{k}-\rho_{k} \boldsymbol{x}_{k} . \end{aligned}`	$\begin{aligned} & s_{k}=\frac{\boldsymbol{y}_{k}^{*} \boldsymbol{A} \boldsymbol{y}_{k}}{\boldsymbol{y}_{k}^{*} \boldsymbol{y}_{k}}=s_{k-1}+\frac{\boldsymbol{y}_{k}^{*} \left(\boldsymbol{A}-s_{k-1} \boldsymbol{I} \right) \boldsymbol{y}_{k}}{\boldsymbol{y}_{k}^{*} \boldsymbol{y}_{k}}=s_{k-1}+\frac{\boldsymbol{y}_{k}^{*} \boldsymbol{x}_{k-1}}{\boldsymbol{y}_{k}^{*} \boldsymbol{y}_{k}}=s_{k-1}+\rho_{k}, \\ & \boldsymbol{r}_{k}=\boldsymbol{A} \boldsymbol{x}_{k}-s_{k} \boldsymbol{x}_{k}=\frac{\boldsymbol{A} \boldsymbol{y}_{k}-\left(s_{k-1}+\rho_{k} \right) \boldsymbol{y}_{k}}{\left\|\boldsymbol{y}_{k}\right\|_{2}}=\frac{\boldsymbol{x}_{k-1}-\rho_{k} \boldsymbol{y}_{k}}{\left\|\boldsymbol{y}_{k}\right\|_{2}}=\boldsymbol{w}_{k}-\rho_{k} \boldsymbol{x}_{k}. \end{aligned}$	$\begin{aligned} & s_{k}=\frac{\boldsymbol{y}_{k}^{*} \boldsymbol{A} \boldsymbol{y}_{k}}{\boldsymbol{y}_{k}^{*} \boldsymbol{y}_{k}}=s_{k-1}+\frac{\boldsymbol{y}_{k}^{*} \left(\boldsymbol{A}-s_{k-1} \boldsymbol{I} \right) \boldsymbol{y}_{k}}{\boldsymbol{y}_{k}^{*} \boldsymbol{y}_{k}}=s_{k-1}+\frac{\boldsymbol{y}_{k}^{*} \boldsymbol{x}_{k-1}}{\boldsymbol{y}_{k}^{*} \boldsymbol{y}_{k}}=s_{k-1}+\rho_{k}, \\ & \boldsymbol{r}_{k}=\boldsymbol{A} \boldsymbol{x}_{k}-s_{k} \boldsymbol{x}_{k}=\frac{\boldsymbol{A} \boldsymbol{y}_{k}-\left(s_{k-1}+\rho_{k} \right) \boldsymbol{y}_{k}}{\left\|\boldsymbol{y}_{k}\right\|_{2}}=\frac{\boldsymbol{x}_{k-1}-\rho_{k} \boldsymbol{y}_{k}}{\left\|\boldsymbol{y}_{k}\right\|_{2}}=\boldsymbol{w}_{k}-\rho_{k} \boldsymbol{x}_{k}. \end{aligned}$

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lyche-numerical-linear-algebra_EQ0097	54	0.999	\left[\begin{array}{lll} 1 & 0 & 0 \\ l_{1} & 1 & 0 \\ 0 & l_{2} & 1 \end{array}\right]\left[\begin{array}{l} z_{1} \\ z_{2} \\ z_{3} \end{array}\right]=\left[\begin{array}{l} b_{1} \\ b_{2} \\ b_{3} \end{array} \right], \quad\left[\begin{array}{ccc} u_{1} & c_{1} & 0 \\ 0 & u_{2} & c_{2} \\ 0 & 0 & u_{3} \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \\ x_{3} \end{array}\right]=\left[\begin{array}{l} z_{1} \\ z_{2} \\ z_{3} \end{array}\right] .	$\left[\begin{array}{lll} 1 & 0 & 0 \\ l_{1} & 1 & 0 \\ 0 & l_{2} & 1 \end{array}\right]\left[\begin{array}{l} z_{1} \\ z_{2} \\ z_{3} \end{array}\right]=\left[\begin{array}{l} b_{1} \\ b_{2} \\ b_{3} \end{array} \right], \quad\left[\begin{array}{ccc} u_{1} & c_{1} & 0 \\ 0 & u_{2} & c_{2} \\ 0 & 0 & u_{3} \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \\ x_{3} \end{array}\right]=\left[\begin{array}{l} z_{1} \\ z_{2} \\ z_{3} \end{array}\right] .$	$\left[\begin{array}{lll} 1 & 0 & 0 \\ l_{1} & 1 & 0 \\ 0 & l_{2} & 1 \end{array}\right]\left[\begin{array}{l} z_{1} \\ z_{2} \\ z_{3} \end{array}\right]=\left[\begin{array}{l} b_{1} \\ b_{2} \\ b_{3} \end{array} \right], \quad\left[\begin{array}{ccc} u_{1} & c_{1} & 0 \\ 0 & u_{2} & c_{2} \\ 0 & 0 & u_{3} \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \\ x_{3} \end{array}\right]=\left[\begin{array}{l} z_{1} \\ z_{2} \\ z_{3} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0380	154	0.999	\boldsymbol{B} \boldsymbol{B}^{*}=\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U} \boldsymbol{U}^{*} \boldsymbol{A}^{*} \boldsymbol{U}=\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{A}^{*} \boldsymbol{U}= \boldsymbol{U}^{*} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{U}=\boldsymbol{B}^{*} \boldsymbol{B} .	$\boldsymbol{B} \boldsymbol{B}^{*}=\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U} \boldsymbol{U}^{*} \boldsymbol{A}^{*} \boldsymbol{U}=\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{A}^{*} \boldsymbol{U}=\boldsymbol{U}^{*} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{U}=\boldsymbol{B}^{*} \boldsymbol{B} .$	$\boldsymbol{B} \boldsymbol{B}^{*}=\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U} \boldsymbol{U}^{*} \boldsymbol{A}^{*} \boldsymbol{U}=\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{A}^{*} \boldsymbol{U}=\boldsymbol{U}^{*} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{U}=\boldsymbol{B}^{*} \boldsymbol{B} .$
lyche-numerical-linear-algebra_EQ0394 (6.13)	158	0.999	\lambda_{k}=\min _{\operatorname{dim}(\mathcal{S})=n-k+1} \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x})=\max _{\operatorname{dim}(\mathcal{S})=k} \min _{\substack{ \boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x}), \quad k=1, \ldots, n .	$\lambda_{k}=\min _{\operatorname{dim}(\mathcal{S})=n-k+1} \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x})=\max _{\operatorname{dim}(\mathcal{S})=k} \min _{\substack{ \boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x}), \quad k=1, \ldots, n .$	$\lambda_{k}=\min _{\operatorname{dim}(\mathcal{S})=n-k+1} \max _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x})=\max _{\operatorname{dim}(\mathcal{S})=k} \min _{\substack{ \boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x}), \quad k=1, \ldots, n .$
lyche-numerical-linear-algebra_EQ0445	178	0.999	\left|\boldsymbol{A}-\boldsymbol{A}^{\prime} \right|_{F}=\min _{\substack{\boldsymbol{B} \in \mathbb{R}^{m \times n} \\ \operatorname{rank}(\boldsymbol{B})=r}}|\boldsymbol{A}-\boldsymbol{B}|_{F}= \sqrt{\sigma_{r+1}^{2}+\cdots+\sigma_{n}^{2}} .	$\left\|\boldsymbol{A}-\boldsymbol{A}^{\prime} \right\|_{F}=\min _{\substack{\boldsymbol{B} \in \mathbb{R}^{m \times n} \\ \operatorname{rank}(\boldsymbol{B})=r}}\|\boldsymbol{A}-\boldsymbol{B}\|_{F}= \sqrt{\sigma_{r+1}^{2}+\cdots+\sigma_{n}^{2}} .$	$\left\|\boldsymbol{A}-\boldsymbol{A}^{\prime} \right\|_{F}=\min _{\substack{\boldsymbol{B} \in \mathbb{R}^{m \times n} \\ \operatorname{rank}(\boldsymbol{B})=r}}\|\boldsymbol{A}-\boldsymbol{B}\|_{F}= \sqrt{\sigma_{r+1}^{2}+\cdots+\sigma_{n}^{2}} .$
lyche-numerical-linear-algebra_EQ0621	227	0.999	\frac{\\|\boldsymbol{A} \boldsymbol{x}\\|_{2}^{2}}{ \\|\boldsymbol{x}\\|_{2}^{2}}=\frac{(\boldsymbol{A} \boldsymbol{x})^{*}(\boldsymbol{A} \boldsymbol{x})}{ \boldsymbol{x}^{*} \boldsymbol{x}}=\frac{ \boldsymbol{x}^{*} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{x}}{\boldsymbol{x}^{*} \boldsymbol{x}}=R_{ \boldsymbol{A}^{*} \boldsymbol{A}}(\boldsymbol{x}),	$\frac{\\|\boldsymbol{A} \boldsymbol{x}\\|_{2}^{2}}{ \\|\boldsymbol{x}\\|_{2}^{2}}=\frac{(\boldsymbol{A} \boldsymbol{x})^{*}(\boldsymbol{A} \boldsymbol{x})}{ \boldsymbol{x}^{*} \boldsymbol{x}}=\frac{ \boldsymbol{x}^{*} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{x}}{\boldsymbol{x}^{*} \boldsymbol{x}}=R_{ \boldsymbol{A}^{*} \boldsymbol{A}}(\boldsymbol{x}),$	$\frac{\\|\boldsymbol{A} \boldsymbol{x}\\|_{2}^{2}}{ \\|\boldsymbol{x}\\|_{2}^{2}}=\frac{(\boldsymbol{A} \boldsymbol{x})^{*}(\boldsymbol{A} \boldsymbol{x})}{ \boldsymbol{x}^{*} \boldsymbol{x}}=\frac{ \boldsymbol{x}^{*} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{x}}{\boldsymbol{x}^{*} \boldsymbol{x}}=R_{ \boldsymbol{A}^{*} \boldsymbol{A}}(\boldsymbol{x}),$
lyche-numerical-linear-algebra_EQ0903	309	0.999	\left|\boldsymbol{\epsilon}_{k}\right|_{2}^{2}- \left|\boldsymbol{\epsilon}_{k+1}\right|_{2}^{2}= \frac{\left|\boldsymbol{p}_{k}\right|_{2}^{2}}{\left |\boldsymbol{p}_{k}\right|_{\boldsymbol{A}}^{2}} \left(\left|\boldsymbol{\epsilon}_{k}\right|_{ \boldsymbol{A}}^{2}+\left|\boldsymbol{\epsilon}_{k+1} \right|_{\boldsymbol{A}}^{2}\right)	$\left\|\boldsymbol{\epsilon}_{k}\right\|_{2}^{2}- \left\|\boldsymbol{\epsilon}_{k+1}\right\|_{2}^{2}= \frac{\left\|\boldsymbol{p}_{k}\right\|_{2}^{2}}{\left \|\boldsymbol{p}_{k}\right\|_{\boldsymbol{A}}^{2}} \left(\left\|\boldsymbol{\epsilon}_{k}\right\|_{ \boldsymbol{A}}^{2}+\left\|\boldsymbol{\epsilon}_{k+1} \right\|_{\boldsymbol{A}}^{2}\right)$	$\left\|\boldsymbol{\epsilon}_{k}\right\|_{2}^{2}- \left\|\boldsymbol{\epsilon}_{k+1}\right\|_{2}^{2}= \frac{\left\|\boldsymbol{p}_{k}\right\|_{2}^{2}}{\left \|\boldsymbol{p}_{k}\right\|_{\boldsymbol{A}}^{2}} \left(\left\|\boldsymbol{\epsilon}_{k}\right\|_{ \boldsymbol{A}}^{2}+\left\|\boldsymbol{\epsilon}_{k+1} \right\|_{\boldsymbol{A}}^{2}\right)$
lyche-numerical-linear-algebra_EQ0003	22	1.000	\boldsymbol{A}=\left[\begin{array}{cccc} a_{11} & a_{12} & \cdots & a_{1 n} \\ a_{21} & a_{22} & \cdots & a_{2 n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m 1} & a_{m 2} & \cdots & a_{m n} \end{array}\right] .	$\boldsymbol{A}=\left[\begin{array}{cccc} a_{11} & a_{12} & \cdots & a_{1 n} \\ a_{21} & a_{22} & \cdots & a_{2 n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m 1} & a_{m 2} & \cdots & a_{m n} \end{array}\right] .$	$\boldsymbol{A}=\left[\begin{array}{cccc} a_{11} & a_{12} & \cdots & a_{1 n} \\ a_{21} & a_{22} & \cdots & a_{2 n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m 1} & a_{m 2} & \cdots & a_{m n} \end{array}\right] .$

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lyche-numerical-linear-algebra_EQ0008	23	■ 1.000	`\boldsymbol{e}_{1}:=\left[\begin{array}{c} 1 \\ 0 \\ 0 \\ \vdots \\ 0 \end{array}\right], \quad \boldsymbol{e}_{2}:=\left[\begin{array}{c} 0 \\ 1 \\ 0 \\ \vdots \\ 0 \end{array}\right], \quad \boldsymbol{e}_{3}:=\left[\begin{array}{c} 0 \\ 0 \\ 1 \\ \vdots \\ 0 \end{array}\right], \quad \ldots, \quad \boldsymbol{e}_{n}:=\left[\begin{array}{c} 0 \\ 0 \\ 0 \\ \vdots \\ 1 \end{array}\right],`	$\boldsymbol{e}_1 := \left[\begin{array}{c} 1 \\ 0 \\ 0 \\ \vdots \\ 0 \end{array}\right], \quad \boldsymbol{e}_2 := \left[\begin{array}{c} 0 \\ 1 \\ 0 \\ \vdots \\ 0 \end{array}\right], \quad \boldsymbol{e}_3 := \left[\begin{array}{c} 0 \\ 0 \\ 1 \\ \vdots \\ 0 \end{array}\right], \quad \ldots, \quad \boldsymbol{e}_n := \left[\begin{array}{c} 0 \\ 0 \\ 0 \\ \vdots \\ 1 \end{array}\right],$	$\boldsymbol{e}_1 := \left[\begin{array}{c} 1 \\ 0 \\ 0 \\ \vdots \\ 0 \end{array}\right], \quad \boldsymbol{e}_2 := \left[\begin{array}{c} 0 \\ 1 \\ 0 \\ \vdots \\ 0 \end{array}\right], \quad \boldsymbol{e}_3 := \left[\begin{array}{c} 0 \\ 0 \\ 1 \\ \vdots \\ 0 \end{array}\right], \quad \ldots, \quad \boldsymbol{e}_n := \left[\begin{array}{c} 0 \\ 0 \\ 0 \\ \vdots \\ 1 \end{array}\right],$
lyche-numerical-linear-algebra_EQ0025	30	■ 1.000	`\sum_{i=1}^{m} b_{i} \boldsymbol{v}_{i}=\boldsymbol{x}= \sum_{j=1}^{n} c_{j} \boldsymbol{s}_{j} \stackrel{(1.9)}{=} \sum_{j=1}^{n} c_{j}\left( \sum_{i=1}^{m} a_{i j} \boldsymbol{v}_{i}\right)= \sum_{i=1}^{m}\left(\sum_{j=1}^{n} a_{i j} c_{j}\right) \boldsymbol{v}_{i} .`	$\sum_{i=1}^{m} b_i \boldsymbol{v}_i = \boldsymbol{x} = \sum_{j=1}^{n} c_j \boldsymbol{s}_j \stackrel{(1.9)}{=} \sum_{j=1}^{n} c_j \left(\sum_{i=1}^{m} a_{ij} \boldsymbol{v}_i\right) = \sum_{i=1}^{m} \left(\sum_{j=1}^{n} a_{ij} c_j\right) \boldsymbol{v}_i.$	$\sum_{i=1}^{m} b_i \boldsymbol{v}_i = \boldsymbol{x} = \sum_{j=1}^{n} c_j \boldsymbol{s}_j \stackrel{(1.9)}{=} \sum_{j=1}^{n} c_j \left(\sum_{i=1}^{m} a_{ij} \boldsymbol{v}_i\right) = \sum_{i=1}^{m} \left(\sum_{j=1}^{n} a_{ij} c_j\right) \boldsymbol{v}_i.$
lyche-numerical-linear-algebra_EQ0053	39	■ 1.000	`\pi_{A}(\lambda)=(-1)^{n} \lambda^{n}+c_{n-1} \lambda^{n-1}+\cdots+c_{0},`	$\pi_A(\lambda) = (-1)^n \lambda^n + c_{n-1}\lambda^{n-1} + \cdots + c_0,$	$\pi_A(\lambda) = (-1)^n \lambda^n + c_{n-1}\lambda^{n-1} + \cdots + c_0,$
lyche-numerical-linear-algebra_EQ0078 (2.2)	46	■ 1.000	`g\left(x_{i}\right)=y_{i}, \text { for } i=1, \ldots, n+1 .`	$g\left(x_i\right) = y_i, \text{ for } i = 1, \ldots, n+1.$	$g\left(x_i\right) = y_i, \text{ for } i = 1, \ldots, n+1.$
lyche-numerical-linear-algebra_EQ0087 (2.9)	51	■ 1.000	`\mu_{i-1}+4 \mu_{i}+\mu_{i+1}=\frac{6}{h^{2}} \left(y_{i+1}-2 y_{i}+y_{i-1}\right), \quad i=2, \ldots, n,`	$\mu_{i-1} + 4\mu_i + \mu_{i+1} = \frac{6}{h^2}\left(y_{i+1} - 2y_i + y_{i-1}\right), \quad i = 2, \ldots, n,$	$\mu_{i-1} + 4\mu_i + \mu_{i+1} = \frac{6}{h^2}(y_{i+1} - 2y_i + y_{i-1}), \quad i = 2, \ldots, n,$
lyche-numerical-linear-algebra_EQ0099 (2.16)	54	■ 1.000	`u_{1}=d_{1}, \quad l_{k}=a_{k} / u_{k}, \quad u_{k+1}=d_{k+1}-l_{k} c_{k}, \quad k=1,2, \ldots, n-1,`	$u_1 = d_1, \quad l_k = a_k / u_k, \quad u_{k+1} = d_{k+1} - l_k c_k, \quad k = 1, 2, \ldots, n-1,$	$u_1 = d_1, \quad l_k = a_k / u_k, \quad u_{k+1} = d_{k+1} - l_k c_k, \quad k = 1, 2, \ldots, n-1,$
lyche-numerical-linear-algebra_EQ0102 (2.19)	56	■ 1.000	`\left|l_{k}\right|=\frac{\left|a_{k}\right|}{\left|u_{k} \right|} \leq \frac{\left|a_{k}\right|}{\left|d_{k} \right|-\left|a_{k-1}\right|},\left|u_{k+1}\right| \leq \left|d_{k+1}\right|+\frac{\left|a_{k}\right|\left|c_{k} \right|}{\left|d_{k}\right|-\left|a_{k-1}\right|}, k=1, \ldots, n-1 .`	$\left\|l_k\right\| = \frac{\left\|a_k\right\|}{\left\|u_k\right\|} \leq \frac{\left\|a_k\right\|}{\left\|d_k\right\| - \left\|a_{k-1}\right\|}, \left\|u_{k+1}\right\| \leq \left\|d_{k+1}\right\| + \frac{\left\|a_k\right\| \left\|c_k\right\|}{\left\|d_k\right\| - \left\|a_{k-1}\right\|}, k = 1, \ldots, n-1.$	$\left\|l_k\right\| = \frac{\left\|a_k\right\|}{\left\|u_k\right\|} \leq \frac{\left\|a_k\right\|}{\left\|d_k\right\| - \left\|a_{k-1}\right\|}, \left\|u_{k+1}\right\| \leq \left\|d_{k+1}\right\| + \frac{\left\|a_k\right\|\left\|c_k\right\|}{\left\|d_k\right\| - \left\|a_{k-1}\right\|}, k = 1, \ldots, n-1.$
lyche-numerical-linear-algebra_EQ0103	56	■ 1.000	`\left|l_{k}\right|=\frac{\left|a_{k}\right|}{\left|u_{k} \right|} \leq \frac{\left|a_{k}\right|}{\left|d_{k} \right|-\left|a_{k-1}\right|},\left|u_{k+1}\right| \leq\left|d_{k+1}\right|+\left|l_{k}\right|\left|c_{k} \right| \leq\left|d_{k+1}\right|+\frac{\left|a_{k}\right| \left|c_{k}\right|}{\left|d_{k}\right|-\left|a_{k-1} \right|} .`	$\left\|l_k\right\| = \frac{\left\|a_k\right\|}{\left\|u_k\right\|} \leq \frac{\left\|a_k\right\|}{\left\|d_k\right\| - \left\|a_{k-1}\right\|}, \left\|u_{k+1}\right\| \leq \left\|d_{k+1}\right\| + \left\|l_k\right\|\left\|c_k\right\| \leq \left\|d_{k+1}\right\| + \frac{\left\|a_k\right\|\left\|c_k\right\|}{\left\|d_k\right\| - \left\|a_{k-1}\right\|}.$	$\left\|l_k\right\| = \frac{\left\|a_k\right\|}{\left\|u_k\right\|} \leq \frac{\left\|a_k\right\|}{\left\|d_k\right\| - \left\|a_{k-1}\right\|}, \left\|u_{k+1}\right\| \leq \left\|d_{k+1}\right\| + \left\|l_k\right\|\left\|c_k\right\| \leq \left\|d_{k+1}\right\| + \frac{\left\|a_k\right\|\left\|c_k\right\|}{\left\|d_k\right\| - \left\|a_{k-1}\right\|}.$
lyche-numerical-linear-algebra_EQ0121 (2.31)	61	■ 1.000	`\boldsymbol{S}=\left[\boldsymbol{s}_{1}, \boldsymbol{s}_{2}, \boldsymbol{s}_{3}\right]=\left[\begin{array}{c} \sin \frac{\pi}{4} \sin \frac{2 \pi}{4} \sin \frac{3 \pi}{4} \\ \sin \frac{2 \pi}{4} \sin \frac{4 \pi}{4} \sin \frac{6 \pi}{4} \\ \sin \frac{3 \pi}{4} \sin \frac{6 \pi}{4} \sin \frac{9 \pi}{4} \end{array}\right]= \left[\begin{array}{ccc} t & 1 & t \\ 1 & 0 & -1 \\ t & -1 & t \end{array}\right], \quad t:=\frac{1}{\sqrt{2}} .`	$\boldsymbol{S} = [\boldsymbol{s}_1, \boldsymbol{s}_2, \boldsymbol{s}_3] = \left[\begin{array}{c} \sin\frac{\pi}{4} \sin\frac{2\pi}{4} \sin\frac{3\pi}{4} \\ \sin\frac{2\pi}{4} \sin\frac{4\pi}{4} \sin\frac{6\pi}{4} \\ \sin\frac{3\pi}{4} \sin\frac{6\pi}{4} \sin\frac{9\pi}{4} \end{array}\right] = \left[\begin{array}{ccc} t & 1 & t \\ 1 & 0 & -1 \\ t & -1 & t \end{array}\right], \quad t := \frac{1}{\sqrt{2}}.$	$\boldsymbol{S} = [\boldsymbol{s}_1, \boldsymbol{s}_2, \boldsymbol{s}_3] = \left[\begin{array}{c} \sin\frac{\pi}{4} \sin\frac{2\pi}{4} \sin\frac{3\pi}{4} \\ \sin\frac{2\pi}{4} \sin\frac{4\pi}{4} \sin\frac{6\pi}{4} \\ \sin\frac{3\pi}{4} \sin\frac{6\pi}{4} \sin\frac{9\pi}{4} \end{array}\right] = \left[\begin{array}{ccc} t & 1 & t \\ 1 & 0 & -1 \\ t & -1 & t \end{array}\right], \quad t := \frac{1}{\sqrt{2}}.$

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lyche-numerical-linear-algebra_EQ0123 (2.32)	61	1.000	`\boldsymbol{s}_{j}^{T} \boldsymbol{s}_{k}=\frac{m+1}{2} \delta_{j, k}=\frac{1}{2 h} \delta_{j, k}, \quad j, k=1, \ldots, m .`	$\boldsymbol{s}_j^T \boldsymbol{s}_k=\frac{m+1}{2} \delta_{j, k}=\frac{1}{2 h} \delta_{j, k}, \quad j, k=1, \ldots, m .$	$\boldsymbol{s}_j^T \boldsymbol{s}_k=\frac{m+1}{2} \delta_{j, k}=\frac{1}{2 h} \delta_{j, k}, \quad j, k=1, \ldots, m .$
lyche-numerical-linear-algebra_EQ0128	62	1.000	`\boldsymbol{A}=\left[\begin{array}{lll} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{array}\right]`	$\boldsymbol{A}=\left[\begin{array}{lll} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{array}\right]$	$\boldsymbol{A}=\left[\begin{array}{lll} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{array}\right]$
lyche-numerical-linear-algebra_EQ0186 (3.5)	79	1.000	`(\boldsymbol{L} \boldsymbol{U})_{i j}=\sum_{k=1}^{i-1} l_{i k}^{(k)} a_{k j}^{(k)}+a_{i j}^{(i)}= \sum_{k=1}^{i-1}\left(a_{i j}^{(k)}-a_{i j}^{(k+1)} \right)+a_{i j}^{(i)}=a_{i j}^{(1)}=a_{i j},`	$(\boldsymbol{L} \boldsymbol{U})_{i j}=\sum_{k=1}^{i-1} l_{i k}^{(k)} a_{k j}^{(k)}+a_{i j}^{(i)}=\sum_{k=1}^{i-1}\left(a_{i j}^{(k)}-a_{i j}^{(k+1)}\right)+a_{i j}^{(i)}=a_{i j}^{(1)}=a_{i j},$	$(\boldsymbol{L} \boldsymbol{U})_{i j}=\sum_{k=1}^{i-1} l_{i k}^{(k)} a_{k j}^{(k)}+a_{i j}^{(i)}=\sum_{k=1}^{i-1}\left(a_{i j}^{(k)}-a_{i j}^{(k+1)}\right)+a_{i j}^{(i)}=a_{i j}^{(1)}=a_{i j},$
lyche-numerical-linear-algebra_EQ0193	82	1.000	`\left[\begin{array}{cccc} a_{k+1, k+1} & 0 & \cdots & 0 \\ a_{k+2, k+1} & a_{k+2, k+2} & \cdots & 0 \\ \vdots & & \ddots & \vdots \\ a_{n, k+1} & & \cdots & a_{n, n} \end{array}\right]\left[\begin{array}{c} x_{k+1} \\ \vdots \\ x_{n} \end{array}\right]=\left[\begin{array}{c} b_{k+1} \\ \vdots \\ b_{n} \end{array}\right]-x_{k} \left[\begin{array}{c} a_{k+1, k} \\ \vdots \\ a_{n, k} \end{array}\right] .`	$\left[\begin{array}{cccc} a_{k+1, k+1} & 0 & \cdots & 0 \\ a_{k+2, k+1} & a_{k+2, k+2} & \cdots & 0 \\ \vdots & & \ddots & \vdots \\ a_{n, k+1} & & \cdots & a_{n, n} \end{array}\right]\left[\begin{array}{c} x_{k+1} \\ \vdots \\ x_{n} \end{array}\right]=\left[\begin{array}{c} b_{k+1} \\ \vdots \\ b_{n} \end{array}\right]-x_{k} \left[\begin{array}{c} a_{k+1, k} \\ \vdots \\ a_{n, k} \end{array}\right] .$	$\left[\begin{array}{cccc} a_{k+1, k+1} & 0 & \cdots & 0 \\ a_{k+2, k+1} & a_{k+2, k+2} & \cdots & 0 \\ \vdots & & \ddots & \vdots \\ a_{n, k+1} & & \cdots & a_{n, n} \end{array}\right]\left[\begin{array}{c} x_{k+1} \\ \vdots \\ x_{n} \end{array}\right]=\left[\begin{array}{c} b_{k+1} \\ \vdots \\ b_{n} \end{array}\right]-x_{k} \left[\begin{array}{c} a_{k+1, k} \\ \vdots \\ a_{n, k} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0240 (3.32)	97	1.000	`\boldsymbol{L}=\left[\begin{array}{cc} 1 & 0 \ \ \boldsymbol{\ell}_{1} & \boldsymbol{L}_{2,2} \end{array}\right], \quad \boldsymbol{U}=\left[ \begin{array}{cc} u_{1,1} & \boldsymbol{u}_{1}^{T} \\ 0 & \boldsymbol{U}_{2,2} \end{array}\right],`	$\boldsymbol{L}=\left[\begin{array}{cc} 1 & 0 \ \ \boldsymbol{\ell}_{1} & \boldsymbol{L}_{2,2} \end{array}\right], \quad \boldsymbol{U}=\left[\begin{array}{cc} u_{1,1} & \boldsymbol{u}_{1}^{T} \\ 0 & \boldsymbol{U}_{2,2} \end{array}\right],$	$\boldsymbol{L}=\left[\begin{array}{cc} 1 & 0 \ \ \boldsymbol{\ell}_{1} & \boldsymbol{L}_{2,2} \end{array}\right], \quad \boldsymbol{U}=\left[\begin{array}{cc} u_{1,1} & \boldsymbol{u}_{1}^{T} \\ 0 & \boldsymbol{U}_{2,2} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0270	113	1.000	`\boldsymbol{A}[a]:=\left[\begin{array}{cc} 2 & 2-a \\ a & 1 \end{array}\right], \quad a \in \mathbb{R}`	$\boldsymbol{A}[a]:=\left[\begin{array}{cc} 2 & 2-a \\ a & 1 \end{array}\right], \quad a \in \mathbb{R}$	$\boldsymbol{A}[a]:=\left[\begin{array}{cc} 2 & 2-a \\ a & 1 \end{array}\right], \quad a \in \mathbb{R}$
lyche-numerical-linear-algebra_EQ0274	114	1.000	`\boldsymbol{A}_{+}=\left[\begin{array}{cc} \boldsymbol{A} & \boldsymbol{a} \\ \boldsymbol{a}^{T} & \alpha \end{array}\right],`	$\boldsymbol{A}_{+}=\left[\begin{array}{cc} \boldsymbol{A} & \boldsymbol{a} \\ \boldsymbol{a}^{T} & \alpha \end{array}\right],$	$\boldsymbol{A}_{+}=\left[\begin{array}{cc} \boldsymbol{A} & \boldsymbol{a} \\ \boldsymbol{a}^{T} & \alpha \end{array}\right],$
lyche-numerical-linear-algebra_EQ0283 (5.4)	118	1.000	`\langle a \boldsymbol{y}, \boldsymbol{z}\rangle+\langle \boldsymbol{z}, a \boldsymbol{y}\rangle=a \overline{ \langle\boldsymbol{z}, \boldsymbol{y}\rangle}+\bar{a} \langle\boldsymbol{z}, \boldsymbol{y}\rangle=0 .`	$\langle a \boldsymbol{y}, \boldsymbol{z}\rangle+\langle \boldsymbol{z}, a \boldsymbol{y}\rangle=a \overline{\langle\boldsymbol{z}, \boldsymbol{y}\rangle}+\bar{a} \langle\boldsymbol{z}, \boldsymbol{y}\rangle=0 .$	$\langle a \boldsymbol{y}, \boldsymbol{z}\rangle+\langle \boldsymbol{z}, a \boldsymbol{y}\rangle=a \overline{\langle\boldsymbol{z}, \boldsymbol{y}\rangle}+\bar{a} \langle\boldsymbol{z}, \boldsymbol{y}\rangle=0 .$
lyche-numerical-linear-algebra_EQ0328	133	1.000	`\boldsymbol{R}_{1}=\boldsymbol{R}=\left[ \begin{array}{cc} \left\\|\boldsymbol{v}_{1}\right\\|_{2} & \boldsymbol{a}_{2}^{T} \boldsymbol{q}_{1} \\ 0 & \left \\|\boldsymbol{v}_{2}\right\\|_{2} \end{array}\right]= \frac{1}{\sqrt{5}}\left[\begin{array}{cc} 5 & -4 \\ 0 & 3 \end{array}\right]`	$\boldsymbol{R}_{1}=\boldsymbol{R}=\left[\begin{array}{cc} \left\\|\boldsymbol{v}_{1}\right\\|_{2} & \boldsymbol{a}_{2}^{T} \boldsymbol{q}_{1} \\ 0 & \left \\|\boldsymbol{v}_{2}\right\\|_{2} \end{array}\right]= \frac{1}{\sqrt{5}}\left[\begin{array}{cc} 5 & -4 \\ 0 & 3 \end{array}\right]$	$\boldsymbol{R}_{1}=\boldsymbol{R}=\left[\begin{array}{cc} \left\\|\boldsymbol{v}_{1}\right\\|_{2} & \boldsymbol{a}_{2}^{T} \boldsymbol{q}_{1} \\ 0 & \left \\|\boldsymbol{v}_{2}\right\\|_{2} \end{array}\right]= \frac{1}{\sqrt{5}}\left[\begin{array}{cc} 5 & -4 \\ 0 & 3 \end{array}\right]$
lyche-numerical-linear-algebra_EQ0341	137	1.000	`\boldsymbol{B}:=\left[\begin{array}{llll} 0 & 1 & 0 & 0 \ \ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ \epsilon & 0 & 0 & 0 \end{array}\right],`	$\boldsymbol{B}:=\left[\begin{array}{llll} 0 & 1 & 0 & 0 \ \ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ \epsilon & 0 & 0 & 0 \end{array}\right],$	$\boldsymbol{B}:=\left[\begin{array}{llll} 0 & 1 & 0 & 0 \ \ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ \epsilon & 0 & 0 & 0 \end{array}\right],$

Identifier	Page	Conf.	LaTeX source	Rendered	Image
lyche-numerical-linear-algebra_EQ0345	139	■ 1.000	\boldsymbol{V}_{r}:=\boldsymbol{I}_{r}-2 \frac{ \boldsymbol{v}_{r} \boldsymbol{v}_{r}^{*}}{ \boldsymbol{v}_{r}^{*} \boldsymbol{v}_{r}}= \boldsymbol{I}_{r}-\boldsymbol{u}_{r} \boldsymbol{u}_{r}^{*}, \text { with } \boldsymbol{u}_{r}:=\sqrt{2} \frac{\boldsymbol{v}_{r}}{ \left\\|\boldsymbol{v}_{r}\right\\|_{2}} .	$\boldsymbol{V}_r := \boldsymbol{I}_r - 2\frac{\boldsymbol{v}_r\boldsymbol{v}_r^*}{\boldsymbol{v}_r^*\boldsymbol{v}_r} = \boldsymbol{I}_r - \boldsymbol{u}_r\boldsymbol{u}_r^*, \text{ with } \boldsymbol{u}_r := \sqrt{2}\frac{\boldsymbol{v}_r}{\left\\|\boldsymbol{v}_r\right\\|_2}.$	$\boldsymbol{V}_r := \boldsymbol{I}_r - 2\frac{\boldsymbol{v}_r\boldsymbol{v}_r^*}{\boldsymbol{v}_r^*\boldsymbol{v}_r} = \boldsymbol{I}_r - \boldsymbol{u}_r\boldsymbol{u}_r^*, \text{ with } \boldsymbol{u}_r := \sqrt{2}\frac{\boldsymbol{v}_r}{\left\\|\boldsymbol{v}_r\right\\|_2}.$
lyche-numerical-linear-algebra_EQ0363	147	■ 1.000	E:=\left[\begin{array}{cc} A C & 0 \\ C & 0 \end{array} \right], \quad F:=\left[\begin{array}{cc} 0 & 0 \\ C & C A \end{array}\right], \quad S=\left[\begin{array}{cc} I & A \\ 0 & I \end{array}\right] .	$E := \begin{bmatrix} AC & 0 \\ C & 0 \end{bmatrix}, \quad F := \begin{bmatrix} 0 & 0 \\ C & CA \end{bmatrix}, \quad S = \begin{bmatrix} I & A \\ 0 & I \end{bmatrix}.$	$\boldsymbol{E} := \begin{bmatrix} \boldsymbol{AC} & \boldsymbol{0} \\ \boldsymbol{C} & \boldsymbol{0} \end{bmatrix}, \quad \boldsymbol{F} := \begin{bmatrix} \boldsymbol{0} & \boldsymbol{0} \\ \boldsymbol{C} & \boldsymbol{CA} \end{bmatrix}, \quad \boldsymbol{S} = \begin{bmatrix} \boldsymbol{I} & \boldsymbol{A} \\ \boldsymbol{0} & \boldsymbol{I} \end{bmatrix}.$
lyche-numerical-linear-algebra_EQ0364 (6.2)	148	■ 1.000	\pi_{\boldsymbol{A}}(\lambda):=\operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I})=\left(\lambda_{1}- \lambda\right)^{a_{1}} \cdots\left(\lambda_{k}-\lambda \right)^{a_{k}}, \quad \lambda_{i} \neq \lambda_{j}, i \neq j, \sum_{i=1}^{k} a_{i}=n .	$\pi_{\boldsymbol{A}}(\lambda) := \operatorname{det}(\boldsymbol{A} - \lambda\boldsymbol{I}) = (\lambda_1 - \lambda)^{a_1} \cdots (\lambda_k - \lambda)^{a_k}, \quad \lambda_i \neq \lambda_j, i \neq j, \sum_{i=1}^{k} a_i = n.$	$\pi_{\boldsymbol{A}}(\lambda) := \operatorname{det}(\boldsymbol{A} - \lambda\boldsymbol{I}) = (\lambda_1 - \lambda)^{a_1} \cdots (\lambda_k - \lambda)^{a_k}, \quad \lambda_i \neq \lambda_j, \ i \neq j, \ \sum_{i=1}^{k} a_i = n.$
lyche-numerical-linear-algebra_EQ0393 (6.12)	157	■ 1.000	\lambda_{k} \geq \min _{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x}),	$\lambda_k \geq \min_{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x}),$	$\lambda_k \geq \min_{\substack{\boldsymbol{x} \in \mathcal{S} \\ \boldsymbol{x} \neq \mathbf{0}}} R(\boldsymbol{x}),$
lyche-numerical-linear-algebra_EQ0413	165	■ 1.000	\lambda_{\min }=\min _{\boldsymbol{x} \neq 0} R(\boldsymbol{x})=\min _{\\|\boldsymbol{x}\\|_{2}=1} R(\boldsymbol{x}),	$\lambda_{\min} = \min_{\boldsymbol{x} \neq 0} R(\boldsymbol{x}) = \min_{\left\\|\boldsymbol{x}\right\\|_2 = 1} R(\boldsymbol{x}),$	$\lambda_{\min} = \min_{\boldsymbol{x} \neq 0} R(\boldsymbol{x}) = \min_{\left\\|\boldsymbol{x}\right\\|_2 = 1} R(\boldsymbol{x}),$
lyche-numerical-linear-algebra_EQ0427 (2)	172	■ 1.000	\left[\begin{array}{ll} 1 & -1 \\ 1 & -1 \end{array} \right]=\frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & 1 \\ 1 & -1 \end{array}\right]\left[\begin{array}{ll} 2 & 0 \\ 0 & 0 \end{array}\right] \frac{1}{\sqrt{2}} \left[\begin{array}{cc} 1 & -1 \\ 1 & 1 \end{array} \right]=\frac{1}{\sqrt{2}}\left[\begin{array}{l} 1 \\ 1 \end{array}\right][2] \frac{1}{\sqrt{2}}\left[\begin{array}{ll} 1 & -1 \end{array}\right] .	$\begin{bmatrix} 1 & -1 \\ 1 & -1 \end{bmatrix} = \frac{1}{\sqrt{2}}\begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix}\begin{bmatrix} 2 & 0 \\ 0 & 0 \end{bmatrix}\frac{1}{\sqrt{2}}\begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix} = \frac{1}{\sqrt{2}}\begin{bmatrix} 1 \\ 1 \end{bmatrix}[2]\frac{1}{\sqrt{2}}\begin{bmatrix} 1 & -1 \end{bmatrix}.$	$\begin{bmatrix} 1 & -1 \\ 1 & -1 \end{bmatrix} = \frac{1}{\sqrt{2}}\begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix}\begin{bmatrix} 2 & 0 \\ 0 & 0 \end{bmatrix}\frac{1}{\sqrt{2}}\begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix} = \frac{1}{\sqrt{2}}\begin{bmatrix} 1 \\ 1 \end{bmatrix}[2]\frac{1}{\sqrt{2}}\begin{bmatrix} 1 & -1 \end{bmatrix}.$
lyche-numerical-linear-algebra_EQ0435	173	■ 1.000	\boldsymbol{U}:=\left[\begin{array}{ccc} 1 / \sqrt{2} & -1 / \sqrt{2} & 0 \\ 1 / \sqrt{2} & 1 / \sqrt{2} & 0 \\ 0 & 0 & 1 \end{array}\right] \in \mathbb{R}^{3,3}, \quad \boldsymbol{\Sigma}:=\left[\begin{array}{ll} 2 & 0 \\ 0 & 0 \\ 0 & 0 \end{array}\right] \in \mathbb{R}^{3,2}, \quad \boldsymbol{V}:=\frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & 1 \\ 1 & -1 \end{array}\right] \in \mathbb{R}^{2,2}.	$\boldsymbol{U} := \begin{bmatrix} 1/\sqrt{2} & -1/\sqrt{2} & 0 \\ 1/\sqrt{2} & 1/\sqrt{2} & 0 \\ 0 & 0 & 1 \end{bmatrix} \in \mathbb{R}^{3,3}, \quad \boldsymbol{\Sigma} := \begin{bmatrix} 2 & 0 \\ 0 & 0 \\ 0 & 0 \end{bmatrix} \in \mathbb{R}^{3,2}, \quad \boldsymbol{V} := \frac{1}{\sqrt{2}}\begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix} \in \mathbb{R}^{2,2}.$	$\boldsymbol{U} := \begin{bmatrix} 1/\sqrt{2} & -1/\sqrt{2} & 0 \\ 1/\sqrt{2} & 1/\sqrt{2} & 0 \\ 0 & 0 & 1 \end{bmatrix} \in \mathbb{R}^{3,3}, \quad \boldsymbol{\Sigma} := \begin{bmatrix} 2 & 0 \\ 0 & 0 \\ 0 & 0 \end{bmatrix} \in \mathbb{R}^{3,2}, \quad \boldsymbol{V} := \frac{1}{\sqrt{2}}\begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix} \in \mathbb{R}^{2,2}.$
lyche-numerical-linear-algebra_EQ0439	175	■ 1.000	A:=\frac{1}{25}\left[\begin{array}{ll} 11 & 48 \\ 48 & 39 \end{array}\right]	$A := \frac{1}{25}\begin{bmatrix} 11 & 48 \\ 48 & 39 \end{bmatrix}$	$\boldsymbol{A} := \frac{1}{25}\begin{bmatrix} 11 & 48 \\ 48 & 39 \end{bmatrix}$
lyche-numerical-linear-algebra_EQ0442	177	■ 1.000	\\|\boldsymbol{A} \boldsymbol{B}\\|_{F}^{2}=\sum_{i=1}^{m} \sum_{j=1}^{k}\left|\boldsymbol{a}_{i:}^{*} \boldsymbol{b}_{: j}\right|^{2} \leq \sum_{i=1}^{m} \sum_{j=1}^{k}\left\\|\boldsymbol{a}_{i:}\right \\|_{2}^{2}\left\\|\boldsymbol{b}_{: j}\right\\|_{2}^{2}=\\| \boldsymbol{A}\\|_{F}^{2}\\|\boldsymbol{B}\\|_{F}^{2} .	$\\|\boldsymbol{AB}\\|_F^2 = \sum_{i=1}^{m}\sum_{j=1}^{k}\left\|\boldsymbol{a}_{i:}^*\boldsymbol{b}_{:j}\right\|^2 \leq \sum_{i=1}^{m}\sum_{j=1}^{k}\left\\|\boldsymbol{a}_{i:}\right\\|_2^2\left\\|\boldsymbol{b}_{:j}\right\\|_2^2 = \\|\boldsymbol{A}\\|_F^2\\|\boldsymbol{B}\\|_F^2.$	$\\|\boldsymbol{AB}\\|_F^2 = \sum_{i=1}^{m}\sum_{j=1}^{k}\left\|\boldsymbol{a}_{i:}^*\boldsymbol{b}_{:j}\right\|^2 \leq \sum_{i=1}^{m}\sum_{j=1}^{k}\left\\|\boldsymbol{a}_{i:}\right\\|_2^2\left\\|\boldsymbol{b}_{:j}\right\\|_2^2 = \\|\boldsymbol{A}\\|_F^2\\|\boldsymbol{B}\\|_F^2.$

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lyche-numerical-linear-algebra_EQ0447 (7.11)	178	■ 1.000	\boldsymbol{A}:=\left[\begin{array}{ll} 1 & -1 \\ 1 & -1 \end{array}\right]=\frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & 1 \\ 1 & -1 \end{array}\right] \left[\begin{array}{ll} 2 & 0 \\ 0 & 0 \end{array}\right] \frac{1}{\sqrt{2}}\left[\begin{array}{cc} 1 & -1 \\ 1 & 1 \end{array}\right]=: \boldsymbol{U} \boldsymbol{\Sigma} \boldsymbol{V}^{T}	$\boldsymbol{A} := \begin{bmatrix} 1 & -1 \\ 1 & -1 \end{bmatrix} = \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix} \begin{bmatrix} 2 & 0 \\ 0 & 0 \end{bmatrix} \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix} =: \boldsymbol{U}\boldsymbol{\Sigma}\boldsymbol{V}^T$	$\boldsymbol{A} := \begin{bmatrix} 1 & -1 \\ 1 & -1 \end{bmatrix} = \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix} \begin{bmatrix} 2 & 0 \\ 0 & 0 \end{bmatrix} \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix} =: \boldsymbol{U}\boldsymbol{\Sigma}\boldsymbol{V}^T$
lyche-numerical-linear-algebra_EQ0457	181	■ 1.000	\boldsymbol{A}=\left[\begin{array}{cc} 1 & 2 \\ 0 & 1 \\ -1 & 3 \end{array}\right] .	$\boldsymbol{A} = \begin{bmatrix} 1 & 2 \\ 0 & 1 \\ -1 & 3 \end{bmatrix}.$	$\boldsymbol{A} = \begin{bmatrix} 1 & 2 \\ 0 & 1 \\ -1 & 3 \end{bmatrix}.$
lyche-numerical-linear-algebra_EQ0463	183	■ 1.000	\boldsymbol{T}=\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right] .	$\boldsymbol{T} = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}.$	$\boldsymbol{T} = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}.$
lyche-numerical-linear-algebra_EQ0484 (8.16)	190	■ 1.000	|\boldsymbol{A}|=\left|\boldsymbol{A} \boldsymbol{x}^{*}\right| \text { for some } \boldsymbol{x}^{*} \in \mathcal{S} .	$\|\boldsymbol{A}\| = \|\boldsymbol{A}\boldsymbol{x}^*\| \text{ for some } \boldsymbol{x}^* \in \mathcal{S}.$	$\|\boldsymbol{A}\| = \|\boldsymbol{A}\boldsymbol{x}^*\| \text{ for some } \boldsymbol{x}^* \in \mathcal{S}.$
lyche-numerical-linear-algebra_EQ0490	192	■ 1.000	|\boldsymbol{A} \boldsymbol{x}|_{\infty}=\max _{1 \leq k \leq m}\left|\sum_{j=1}^{n} a_{k j} x_{j}\right| \leq \max _{1 \leq k \leq m} \sum_{j=1}^{n}\left|a_{k j} \right|\left|x_{j}\right| \leq K_{\infty} .	$\|\boldsymbol{A}\boldsymbol{x}\|_\infty = \max_{1\le k\le m} \left\|\sum_{j=1}^{n} a_{kj}x_j\right\| \le \max_{1\le k\le m}\sum_{j=1}^{n}\|a_{kj}\|\,\|x_j\| \le K_\infty.$	$\|\boldsymbol{A}\boldsymbol{x}\|_\infty = \max_{1\le k\le m} \left\|\sum_{j=1}^{n} a_{kj}x_j\right\| \le \max_{1\le k\le m}\sum_{j=1}^{n}\|a_{kj}\|\,\|x_j\| \le K_\infty.$
lyche-numerical-linear-algebra_EQ0493 (8.21)	193	■ 1.000	|\boldsymbol{A}|_{2}^{2}|\boldsymbol{v}|_{1}= \sigma^{2}|\boldsymbol{v}|_{1}=\left|\sigma^{2} \boldsymbol{v}\right|_{1}=\left|\boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{v}\right|_{1} \leq\left| \boldsymbol{A}^{*}\right|_{1}|\boldsymbol{A}|_{1}| \boldsymbol{v}|_{1} .	$\|\boldsymbol{A}\|_2^2\|\boldsymbol{v}\|_1 = \sigma^2\|\boldsymbol{v}\|_1 = \left\|\sigma^2\boldsymbol{v}\right\|_1 = \|\boldsymbol{A}^*\boldsymbol{A}\boldsymbol{v}\|_1 \le \|\boldsymbol{A}^*\|_1\,\|\boldsymbol{A}\|_1\|\boldsymbol{v}\|_1.$	$\|\boldsymbol{A}\|_2^2\|\boldsymbol{v}\|_1 = \sigma^2\|\boldsymbol{v}\|_1 = \|\sigma^2\boldsymbol{v}\|_1 = \|\boldsymbol{A}^*\boldsymbol{A}\boldsymbol{v}\|_1 \le \|\boldsymbol{A}^*\|_1\|\boldsymbol{A}\|_1\|\boldsymbol{v}\|_1.$
lyche-numerical-linear-algebra_EQ0505 (8.27)	198	■ 1.000	\frac{\left|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1} \right|}{\left|\boldsymbol{B}^{-1}\right|} \leq \left|\boldsymbol{A}^{-1} \boldsymbol{E}\right| \leq K(\boldsymbol{A}) \frac{|\boldsymbol{E}|}{| \boldsymbol{A}|},	$\frac{\left\|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}\right\|}{\left\|\boldsymbol{B}^{-1}\right\|} \le \left\|\boldsymbol{A}^{-1}\boldsymbol{E}\right\| \le K(\boldsymbol{A})\frac{\|\boldsymbol{E}\|}{\|\boldsymbol{A}\|},$	$\frac{\left\|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}\right\|}{\left\|\boldsymbol{B}^{-1}\right\|} \le \left\|\boldsymbol{A}^{-1}\boldsymbol{E}\right\| \le K(\boldsymbol{A})\frac{\|\boldsymbol{E}\|}{\|\boldsymbol{A}\|},$
lyche-numerical-linear-algebra_EQ0509	198	■ 1.000	\left|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}\right | \leq\left|\boldsymbol{A}^{-1} \boldsymbol{E} \right|\left|\boldsymbol{B}^{-1}\right| \leq K(A) \frac{|\boldsymbol{E}|}{|\boldsymbol{A}|}\left| \boldsymbol{B}^{-1}\right| .	$\left\|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}\right\| \le \left\|\boldsymbol{A}^{-1}\boldsymbol{E}\right\|\left\|\boldsymbol{B}^{-1}\right\| \le K(A)\frac{\|\boldsymbol{E}\|}{\|\boldsymbol{A}\|}\left\|\boldsymbol{B}^{-1}\right\|.$	$\left\|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}\right\| \le \left\|\boldsymbol{A}^{-1}\boldsymbol{E}\right\|\left\|\boldsymbol{B}^{-1}\right\| \le K(A)\frac{\|\boldsymbol{E}\|}{\|\boldsymbol{A}\|}\left\|\boldsymbol{B}^{-1}\right\|.$
lyche-numerical-linear-algebra_EQ0521 (8.34)	201	■ 1.000	a^{\frac{1}{p}} b^{\frac{1}{q}} \leq \frac{1}{p} a+ \frac{1}{q} b, \text { where } \frac{1}{p}+\frac{1}{q}=1 .	$a^{\frac{1}{p}} b^{\frac{1}{q}} \leq \frac{1}{p} a+\frac{1}{q} b, \text{ where } \frac{1}{p}+\frac{1}{q}=1.$	$a^{\frac{1}{p}} b^{\frac{1}{q}} \leq \frac{1}{p} a+\frac{1}{q} b, \text{ where } \frac{1}{p}+\frac{1}{q}=1.$
lyche-numerical-linear-algebra_EQ0528 (8.36)	202	■ 1.000	\langle\boldsymbol{x}, \boldsymbol{y}\rangle:= \frac{1}{4}\left(|\boldsymbol{x}+\boldsymbol{y}|^{2}- |\boldsymbol{x}-\boldsymbol{y}|^{2}\right), \quad \boldsymbol{x}, \boldsymbol{y} \in \mathcal{V}	$\langle \boldsymbol{x}, \boldsymbol{y}\rangle := \frac{1}{4}\left(\|\boldsymbol{x}+\boldsymbol{y}\|^2 - \|\boldsymbol{x}-\boldsymbol{y}\|^2\right), \quad \boldsymbol{x}, \boldsymbol{y} \in \mathcal{V}$	$\langle \boldsymbol{x}, \boldsymbol{y}\rangle := \frac{1}{4}\left(\|\boldsymbol{x}+\boldsymbol{y}\|^2 - \|\boldsymbol{x}-\boldsymbol{y}\|^2\right), \quad \boldsymbol{x}, \boldsymbol{y} \in \mathcal{V}$

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lyche-numerical-linear-algebra_EQ0551	208	■1.000	\boldsymbol{A}:=\left[\begin{array}{cc} 1.1 & 1 \\ 1 & 1 \end{array}\right], \quad \boldsymbol{b}:=\left[\begin{array}{l} b_{1} \\ b_{2} \end{array}\right]=\left[\begin{array}{l} 2.1 \\ 2.0 \end{array}\right], \quad \boldsymbol{e}:=\left[\begin{array}{l} e_{1} \\ e_{2} \end{array}\right], \quad\\|\boldsymbol{e}\\|_{2}=0.1 .	$\boldsymbol{A}:=\left[\begin{array}{cc} 1.1 & 1 \\ 1 & 1 \end{array}\right], \quad \boldsymbol{b}:=\left[\begin{array}{l} b_{1} \\ b_{2} \end{array}\right]=\left[\begin{array}{l} 2.1 \\ 2.0 \end{array}\right], \quad \boldsymbol{e}:=\left[\begin{array}{l} e_{1} \\ e_{2} \end{array}\right], \quad \|\boldsymbol{e}\|_{2}=0.1.$	$\boldsymbol{A}:=\left[\begin{array}{cc} 1.1 & 1 \\ 1 & 1 \end{array}\right], \quad \boldsymbol{b}:=\left[\begin{array}{l} b_{1} \\ b_{2} \end{array}\right]=\left[\begin{array}{l} 2.1 \\ 2.0 \end{array}\right], \quad \boldsymbol{e}:=\left[\begin{array}{l} e_{1} \\ e_{2} \end{array}\right], \quad \|\boldsymbol{e}\|_{2}=0.1.$
lyche-numerical-linear-algebra_EQ0598	220	■1.000	\boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{x}= \boldsymbol{A}^{*} \boldsymbol{b} \Longrightarrow \boldsymbol{R}_{1} \boldsymbol{x}=\boldsymbol{c}_{1}, \quad \boldsymbol{c}_{1}:=\boldsymbol{Q}_{1}^{*} \boldsymbol{b} .	$\boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{x}=\boldsymbol{A}^{*} \boldsymbol{b} \Longrightarrow \boldsymbol{R}_{1} \boldsymbol{x}=\boldsymbol{c}_{1}, \quad \boldsymbol{c}_{1}:=\boldsymbol{Q}_{1}^{*} \boldsymbol{b}.$	$\boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{x}=\boldsymbol{A}^{*} \boldsymbol{b} \Longrightarrow \boldsymbol{R}_{1} \boldsymbol{x}=\boldsymbol{c}_{1}, \quad \boldsymbol{c}_{1}:=\boldsymbol{Q}_{1}^{*} \boldsymbol{b}.$
lyche-numerical-linear-algebra_EQ0608 (9.11)	223	■1.000	\boldsymbol{A}^{\dagger}=\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1} \boldsymbol{A}^{*} .	$\boldsymbol{A}^{\dagger}=\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1} \boldsymbol{A}^{*}.$	$\boldsymbol{A}^{\dagger}=\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1} \boldsymbol{A}^{*}.$
lyche-numerical-linear-algebra_EQ0682 (10.15)	245	■1.000	\lambda_{j}=d+2 a \cos (j \pi h), \quad h:=\frac{1}{m+1},	$\lambda_{j}=d+2 a \cos (j \pi h), \quad h:=\frac{1}{m+1},$	$\lambda_{j}=d+2 a \cos (j \pi h), \quad h:=\frac{1}{m+1},$
lyche-numerical-linear-algebra_EQ0684 (10.17)	246	■1.000	\boldsymbol{s}_{j}^{T} \boldsymbol{s}_{k}=\frac{m+1}{2} \delta_{j, k}=\frac{1}{2 h} \delta_{j, k}, \quad j, k=1, \ldots, m .	$\boldsymbol{s}_{j}^{T} \boldsymbol{s}_{k}=\frac{m+1}{2} \delta_{j, k}=\frac{1}{2 h} \delta_{j, k}, \quad j, k=1, \ldots, m.$	$\boldsymbol{s}_{j}^{T} \boldsymbol{s}_{k}=\frac{m+1}{2} \delta_{j, k}=\frac{1}{2 h} \delta_{j, k}, \quad j, k=1, \ldots, m.$
lyche-numerical-linear-algebra_EQ0692 (10.22)	248	■1.000	\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}-\frac{1}{6} \boldsymbol{T} \boldsymbol{V} \boldsymbol{T}=h^{2} \mu \boldsymbol{F}	$\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}-\frac{1}{6} \boldsymbol{T} \boldsymbol{V} \boldsymbol{T}=h^{2} \mu \boldsymbol{F}$	$\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}-\frac{1}{6} \boldsymbol{T} \boldsymbol{V} \boldsymbol{T}=h^{2} \mu \boldsymbol{F}.$
lyche-numerical-linear-algebra_EQ0695 (10.21)	248	■1.000	\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}=h^{2} \boldsymbol{F}, \quad \boldsymbol{T} \boldsymbol{U}+\boldsymbol{U} \boldsymbol{T}=h^{2} \boldsymbol{V} .	$\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}=h^{2} \boldsymbol{F}, \quad \boldsymbol{T} \boldsymbol{U}+\boldsymbol{U} \boldsymbol{T}=h^{2} \boldsymbol{V}.$	$\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}=h^{2} \boldsymbol{F}, \quad \boldsymbol{T} \boldsymbol{U}+\boldsymbol{U} \boldsymbol{T}=h^{2} \boldsymbol{V}.$
lyche-numerical-linear-algebra_EQ0721	257	■1.000	\boldsymbol{A} \boldsymbol{P}_{N}=\left[\boldsymbol{a}_{1}, \boldsymbol{a}_{3}, \ldots, \boldsymbol{a}_{N-1}, \boldsymbol{a}_{2}, \boldsymbol{a}_{4}, \ldots, \boldsymbol{a}_{N}\right],	$\boldsymbol{A} \boldsymbol{P}_{N}=\left[\boldsymbol{a}_{1}, \boldsymbol{a}_{3}, \ldots, \boldsymbol{a}_{N-1}, \boldsymbol{a}_{2}, \boldsymbol{a}_{4}, \ldots, \boldsymbol{a}_{N}\right],$	$\boldsymbol{A} \boldsymbol{P}_{N}=\left[\boldsymbol{a}_{1}, \boldsymbol{a}_{3}, \ldots, \boldsymbol{a}_{N-1}, \boldsymbol{a}_{2}, \boldsymbol{a}_{4}, \ldots, \boldsymbol{a}_{N}\right],$
lyche-numerical-linear-algebra_EQ0754 (12.9)	270	■1.000	\boldsymbol{M} \boldsymbol{x}_{k+1}=(\boldsymbol{M}-\boldsymbol{A}) \boldsymbol{x}_{k}+\boldsymbol{b}	$\boldsymbol{M} \boldsymbol{x}_{k+1}=(\boldsymbol{M}-\boldsymbol{A}) \boldsymbol{x}_{k}+\boldsymbol{b}$	$\boldsymbol{M} \boldsymbol{x}_{k+1}=(\boldsymbol{M}-\boldsymbol{A}) \boldsymbol{x}_{k}+\boldsymbol{b}$
lyche-numerical-linear-algebra_EQ0789 (12.29)	277	■1.000	\rho\left(\boldsymbol{G}_{\omega}\right)>\rho\left(\boldsymbol{G}_{\omega^{*}}\right) \text { for } \omega \in(0,2) \backslash\left\{\omega^{*}\right\} .	$\rho\left(\boldsymbol{G}_{\omega}\right)>\rho\left(\boldsymbol{G}_{\omega^{*}}\right) \text { for } \omega \in(0,2) \backslash\left\{\omega^{*}\right\}.$	$\rho\left(\boldsymbol{G}_{\omega}\right)>\rho\left(\boldsymbol{G}_{\omega^{*}}\right) \text { for } \omega \in(0,2) \backslash\left\{\omega^{*}\right\}.$
lyche-numerical-linear-algebra_EQ0791	278	■1.000	\left|\boldsymbol{x}_{k}-\boldsymbol{x}\right | \leq\left|\boldsymbol{G}^{k}\right|\left| \boldsymbol{x}_{0}-\boldsymbol{x}\right| \approx \rho(\boldsymbol{G})^{k}\left|\boldsymbol{x}_{0}- \boldsymbol{x}\right| .	$\left\|\boldsymbol{x}_{k}-\boldsymbol{x}\right\| \leq\left\|\boldsymbol{G}^{k}\right\|\left\| \boldsymbol{x}_{0}-\boldsymbol{x}\right\| \approx \rho(\boldsymbol{G})^{k}\left\|\boldsymbol{x}_{0}- \boldsymbol{x}\right\|.$	$\left\|\boldsymbol{x}_{k}-\boldsymbol{x}\right\| \leq\left\|\boldsymbol{G}^{k}\right\|\left\| \boldsymbol{x}_{0}-\boldsymbol{x}\right\| \approx \rho(\boldsymbol{G})^{k}\left\|\boldsymbol{x}_{0}- \boldsymbol{x}\right\|.$
lyche-numerical-linear-algebra_EQ0820	285	■1.000	d^{\prime}(\omega)=2\left(\omega \mu^{2}-2\right)<2(\omega-2)<0 .	$d^{\prime}(\omega)=2\left(\omega \mu^{2}-2\right)<2(\omega-2)<0.$	$d^{\prime}(\omega)=2\left(\omega \mu^{2}-2\right)<2(\omega-2)<0.$

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lyche-numerical-linear-algebra_EQ0840 (13.6)	292	1.000	`\begin{aligned} \frac{\partial}{\partial y_{i}} Q(\boldsymbol{y}) & :=\lim _{\varepsilon \rightarrow 0} \frac{1}{\varepsilon}\left(Q\left(\boldsymbol{y}+\varepsilon \boldsymbol{e}_{i} \right)-Q(\boldsymbol{y})\right) \\ & \left.=\lim _{ \varepsilon \rightarrow 0} \frac{1}{\varepsilon}\left(- \varepsilon \boldsymbol{e}_{i}^{T} \boldsymbol{r}(\boldsymbol{y})\right)+\frac{1}{2} \varepsilon^{2} \boldsymbol{e}_{i}^{T} \boldsymbol{A} \boldsymbol{e}_{i} \right)=-\boldsymbol{e}_{i}^{T} \boldsymbol{r}(\boldsymbol{y}), \quad i=1, \ldots, n, \end{aligned}`	$\frac{\partial}{\partial y_i} Q(\boldsymbol{y}) := \lim_{\varepsilon \rightarrow 0} \frac{1}{\varepsilon}\left(Q\left(\boldsymbol{y}+\varepsilon \boldsymbol{e}_i\right)-Q(\boldsymbol{y})\right) = \lim_{\varepsilon \rightarrow 0} \frac{1}{\varepsilon}\left(-\varepsilon \boldsymbol{e}_i^T \boldsymbol{r}(\boldsymbol{y})+\frac{1}{2} \varepsilon^2 \boldsymbol{e}_i^T \boldsymbol{A} \boldsymbol{e}_i\right)=-\boldsymbol{e}_i^T \boldsymbol{r}(\boldsymbol{y}), \quad i=1, \ldots, n,$	$\frac{\partial}{\partial y_i} Q(\boldsymbol{y}) := \lim_{\varepsilon \rightarrow 0} \frac{1}{\varepsilon}\left(Q\left(\boldsymbol{y}+\varepsilon \boldsymbol{e}_i\right)-Q(\boldsymbol{y})\right) = \lim_{\varepsilon \rightarrow 0} \frac{1}{\varepsilon}\left(-\varepsilon \boldsymbol{e}_i^T \boldsymbol{r}(\boldsymbol{y})+\frac{1}{2} \varepsilon^2 \boldsymbol{e}_i^T \boldsymbol{A} \boldsymbol{e}_i\right)=-\boldsymbol{e}_i^T \boldsymbol{r}(\boldsymbol{y}), \quad i=1, \ldots, n,$
lyche-numerical-linear-algebra_EQ0866 (13.23)	301	1.000	`\boldsymbol{r}_{k}^{T} \boldsymbol{w}= \boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{w}=0, \quad \boldsymbol{w} \in \mathbb{W}_{k} .`	$\boldsymbol{r}_k^T \boldsymbol{w}=\boldsymbol{p}_k^T \boldsymbol{A} \boldsymbol{w}=0, \quad \boldsymbol{w} \in \mathbb{W}_k .$	$\boldsymbol{r}_k^T \boldsymbol{w}=\boldsymbol{p}_k^T \boldsymbol{A} \boldsymbol{w}=0, \quad \boldsymbol{w} \in \mathbb{W}_k .$
lyche-numerical-linear-algebra_EQ0874 (13.29)	303	1.000	`\frac{\left|\boldsymbol{x}-\boldsymbol{x}_{k}\right|_{ \boldsymbol{A}}}{\left|\boldsymbol{x}-\boldsymbol{x}_{0} \right|_{\boldsymbol{A}}} \leq \min _{\substack{Q \in \Pi_{k} \\ Q(0)=1}} \max _{\lambda_{\min } \leq x \leq \lambda_{\max }}|Q(x)|=\frac{2}{a^{-k}+a^{k}}, \quad a:= \frac{\sqrt{\kappa}-1}{\sqrt{\kappa}+1},`	$\frac{\left\|\boldsymbol{x}-\boldsymbol{x}_k\right\|_{\boldsymbol{A}}}{\left\|\boldsymbol{x}-\boldsymbol{x}_0\right\|_{\boldsymbol{A}}} \leq \min_{\substack{Q \in \Pi_k \\ Q(0)=1}} \max_{\lambda_{\min} \leq x \leq \lambda_{\max}}\|Q(x)\|=\frac{2}{a^{-k}+a^k}, \quad a:=\frac{\sqrt{\kappa}-1}{\sqrt{\kappa}+1},$	$\frac{\left\|\boldsymbol{x}-\boldsymbol{x}_k\right\|_{\boldsymbol{A}}}{\left\|\boldsymbol{x}-\boldsymbol{x}_0\right\|_{\boldsymbol{A}}} \leq \min_{\substack{Q \in \Pi_k \\ Q(0)=1}} \max_{\lambda_{\min} \leq x \leq \lambda_{\max}}\|Q(x)\|=\frac{2}{a^{-k}+a^k}, \quad a:=\frac{\sqrt{\kappa}-1}{\sqrt{\kappa}+1},$
lyche-numerical-linear-algebra_EQ0875 (13.30)	303	1.000	`\frac{x-1}{x+1}<e^{-2 / x} \quad \text { for } \quad x>1`	$\frac{x-1}{x+1}<e^{-2/x} \quad \text{for} \quad x>1$	$\frac{x-1}{x+1}<e^{-2/x} \quad \text{for} \quad x>1$
lyche-numerical-linear-algebra_EQ0929 (13.58)	315	1.000	`\langle\boldsymbol{V}, \boldsymbol{W}\rangle:=h^{2} \sum_{j, k=1}^{m} v_{j, k} w_{j, k},`	$\langle \boldsymbol{V}, \boldsymbol{W}\rangle := h^2 \sum_{j,k=1}^{m} v_{j,k} w_{j,k},$	$\langle \boldsymbol{V}, \boldsymbol{W}\rangle := h^2 \sum_{j,k=1}^{m} v_{j,k} w_{j,k},$
lyche-numerical-linear-algebra_EQ0930 (13.59)	315	1.000	`\begin{aligned} \left\langle L_{h} v, \boldsymbol{W} \right\rangle & =\sum_{j=1}^{m} \sum_{k=0}^{m} c_{j, k+ \frac{1}{2}}\left(v_{j, k+1}-v_{j, k}\right)\left(w_{j, k+1}-w_{j, k}\right) \\ & +\sum_{j=0}^{m} \sum_{k=1}^{m} c_{j+\frac{1}{2}, k}\left(v_{j+1, k}-v_{j, k}\right) \left(w_{j+1, k}-w_{j, k}\right) . \end{aligned}`	$\begin{aligned} \langle L_h v, \boldsymbol{W}\rangle &= \sum_{j=1}^{m} \sum_{k=0}^{m} c_{j,k+\frac{1}{2}}\left(v_{j,k+1}-v_{j,k}\right)\left(w_{j,k+1}-w_{j,k}\right) \\ &+\sum_{j=0}^{m} \sum_{k=1}^{m} c_{j+\frac{1}{2},k}\left(v_{j+1,k}-v_{j,k}\right)\left(w_{j+1,k}-w_{j,k}\right). \end{aligned}$	$\begin{aligned} \langle L_h v, \boldsymbol{W}\rangle &= \sum_{j=1}^{m} \sum_{k=0}^{m} c_{j,k+\frac{1}{2}}\left(v_{j,k+1}-v_{j,k}\right)\left(w_{j,k+1}-w_{j,k}\right) \\ &+\sum_{j=0}^{m} \sum_{k=1}^{m} c_{j+\frac{1}{2},k}\left(v_{j+1,k}-v_{j,k}\right)\left(w_{j+1,k}-w_{j,k}\right). \end{aligned}$
lyche-numerical-linear-algebra_EQ0946	320	1.000	`\boldsymbol{A}=\left[\begin{array}{rrr} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{array}\right], \quad \text { and } \quad \boldsymbol{b}=\left[\begin{array}{l} 4 \\ 0 \\ 0 \end{array}\right] .`	$\boldsymbol{A}=\left[\begin{array}{rrr} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{array}\right], \quad \text{and} \quad \boldsymbol{b}=\left[\begin{array}{l} 4 \\ 0 \\ 0 \end{array}\right].$	$\boldsymbol{A}=\left[\begin{array}{rrr} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{array}\right], \quad \text{and} \quad \boldsymbol{b}=\left[\begin{array}{l} 4 \\ 0 \\ 0 \end{array}\right].$
lyche-numerical-linear-algebra_EQ0957	322	1.000	`\boldsymbol{r}_{k}:=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k}, \text { and } \rho_{k}:=\left| \boldsymbol{r}_{k}\right|_{2}^{2} .`	$\boldsymbol{r}_k:=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_k, \text{ and } \rho_k:=\left\|\boldsymbol{r}_k\right\|_2^2 .$	$\boldsymbol{r}_k:=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_k, \text{ and } \rho_k:=\left\|\boldsymbol{r}_k\right\|_2^2 .$

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lyche-numerical-linear-algebra_EQ0967	326	■ 1.000	\begin{aligned} \boldsymbol{A} \boldsymbol{D} & = \operatorname{diag}\left(\boldsymbol{A}_{1}, \ldots, \boldsymbol{A}_{r}\right) \operatorname{diag}\left(\boldsymbol{X}_{1}, \ldots, \boldsymbol{X}_{r} \right)=\operatorname{diag}\left(\boldsymbol{A}_{1} \boldsymbol{X}_{1}, \ldots, \boldsymbol{A}_{r} \boldsymbol{X}_{r}\right) \\ & =\operatorname{diag} \left(\boldsymbol{X}_{1} \boldsymbol{D}_{1}, \ldots, \boldsymbol{X}_{r} \boldsymbol{D}_{r}\right)= \boldsymbol{X} \boldsymbol{D} . \end{aligned}	$\begin{aligned} \boldsymbol{A} \boldsymbol{D} & = \operatorname{diag}\left(\boldsymbol{A}_{1}, \ldots, \boldsymbol{A}_{r}\right) \operatorname{diag}\left(\boldsymbol{X}_{1}, \ldots, \boldsymbol{X}_{r} \right)=\operatorname{diag}\left(\boldsymbol{A}_{1} \boldsymbol{X}_{1}, \ldots, \boldsymbol{A}_{r} \boldsymbol{X}_{r}\right) \\ & =\operatorname{diag} \left(\boldsymbol{X}_{1} \boldsymbol{D}_{1}, \ldots, \boldsymbol{X}_{r} \boldsymbol{D}_{r}\right)= \boldsymbol{X} \boldsymbol{D} . \end{aligned}$	$\begin{aligned} \boldsymbol{A} \boldsymbol{D} & = \operatorname{diag}\left(\boldsymbol{A}_{1}, \ldots, \boldsymbol{A}_{r}\right) \operatorname{diag}\left(\boldsymbol{X}_{1}, \ldots, \boldsymbol{X}_{r} \right)=\operatorname{diag}\left(\boldsymbol{A}_{1} \boldsymbol{X}_{1}, \ldots, \boldsymbol{A}_{r} \boldsymbol{X}_{r}\right) \\ & =\operatorname{diag} \left(\boldsymbol{X}_{1} \boldsymbol{D}_{1}, \ldots, \boldsymbol{X}_{r} \boldsymbol{D}_{r}\right)= \boldsymbol{X} \boldsymbol{D} . \end{aligned}$
lyche-numerical-linear-algebra_EQ1030	348	■ 1.000	\mu_{1}(s)=\left(\lambda_{1}-s\right)^{-1}, \mu_{2}(s)= \left(\lambda_{2}-s\right)^{-1}, \ldots, \mu_{n}(s)= \left(\lambda_{n}-s\right)^{-1} .	$\mu_{1}(s)=\left(\lambda_{1}-s\right)^{-1}, \mu_{2}(s)=\left(\lambda_{2}-s\right)^{-1}, \ldots, \mu_{n}(s)=\left(\lambda_{n}-s\right)^{-1} .$	$\mu_{1}(s)=\left(\lambda_{1}-s\right)^{-1}, \mu_{2}(s)=\left(\lambda_{2}-s\right)^{-1}, \ldots, \mu_{n}(s)=\left(\lambda_{n}-s\right)^{-1} .$
lyche-numerical-linear-algebra_EQ1041	352	■ 1.000	A_{14}=\left[\begin{array}{r|rr|r} 2.323 & 0.047223 & -0.39232 & -0.65056 \\ \hline-2.1 e-10 & 0.13029 & 0.36125 & 0.15946 \\ -4.1 e-10 & -0.58622 & 0.052576 & -0.25774 \\ \hline 1.2 e-14 & 3.3 e-05 & -1.1 e-05 & 0.22746 \end{array}\right] .	$A_{14}=\left[\begin{array}{r\|rr\|r} 2.323 & 0.047223 & -0.39232 & -0.65056 \\ \hline-2.1 e-10 & 0.13029 & 0.36125 & 0.15946 \\ -4.1 e-10 & -0.58622 & 0.052576 & -0.25774 \\ \hline 1.2 e-14 & 3.3 e-05 & -1.1 e-05 & 0.22746 \end{array}\right] .$	$A_{14}=\left[\begin{array}{r\|rr\|r} 2.323 & 0.047223 & -0.39232 & -0.65056 \\ \hline-2.1 e-10 & 0.13029 & 0.36125 & 0.15946 \\ -4.1 e-10 & -0.58622 & 0.052576 & -0.25774 \\ \hline 1.2 e-14 & 3.3 e-05 & -1.1 e-05 & 0.22746 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ1045	353	■ 1.000	\tilde{\boldsymbol{Q}}_{k} \tilde{\boldsymbol{R}}_{k}= \tilde{\boldsymbol{Q}}_{k-1}\left(\boldsymbol{Q}_{k} \boldsymbol{R}_{k}\right) \tilde{\boldsymbol{R}}_{k-1}= \tilde{\boldsymbol{Q}}_{k-1} \boldsymbol{A}_{k} \tilde{\boldsymbol{R}}_{k-1}=\left(\tilde{ \boldsymbol{Q}}_{k-1} \tilde{\boldsymbol{Q}}_{k-1}^{*} \right) \boldsymbol{A} \tilde{\boldsymbol{Q}}_{k-1} \tilde{\boldsymbol{R}}_{k-1}=\boldsymbol{A}^{k} .	$\tilde{\boldsymbol{Q}}_{k} \tilde{\boldsymbol{R}}_{k}= \tilde{\boldsymbol{Q}}_{k-1}\left(\boldsymbol{Q}_{k} \boldsymbol{R}_{k}\right) \tilde{\boldsymbol{R}}_{k-1}= \tilde{\boldsymbol{Q}}_{k-1} \boldsymbol{A}_{k} \tilde{\boldsymbol{R}}_{k-1}=\left(\tilde{ \boldsymbol{Q}}_{k-1} \tilde{\boldsymbol{Q}}_{k-1}^{*} \right) \boldsymbol{A} \tilde{\boldsymbol{Q}}_{k-1} \tilde{\boldsymbol{R}}_{k-1}=\boldsymbol{A}^{k} .$	$\tilde{\boldsymbol{Q}}_{k} \tilde{\boldsymbol{R}}_{k}= \tilde{\boldsymbol{Q}}_{k-1}\left(\boldsymbol{Q}_{k} \boldsymbol{R}_{k}\right) \tilde{\boldsymbol{R}}_{k-1}= \tilde{\boldsymbol{Q}}_{k-1} \boldsymbol{A}_{k} \tilde{\boldsymbol{R}}_{k-1}=\left(\tilde{ \boldsymbol{Q}}_{k-1} \tilde{\boldsymbol{Q}}_{k-1}^{*} \right) \boldsymbol{A} \tilde{\boldsymbol{Q}}_{k-1} \tilde{\boldsymbol{R}}_{k-1}=\boldsymbol{A}^{k} .$
lyche-numerical-linear-algebra_EQ1047	354	■ 1.000	\hat{\boldsymbol{A}}_{k}=\tilde{ \boldsymbol{Q}}_{k-1}^{*}(\boldsymbol{A}+\boldsymbol{E}) \tilde{\boldsymbol{Q}}_{k-1}, \quad \boldsymbol{E}= \tilde{\boldsymbol{Q}}_{k-1}\left(a_{i+1, i}^{(k)} \boldsymbol{e}_{i+1} \boldsymbol{e}_{i}^{T}\right) \tilde{\boldsymbol{Q}}_{k-1}^{*} .	$\hat{\boldsymbol{A}}_{k}=\tilde{ \boldsymbol{Q}}_{k-1}^{*}(\boldsymbol{A}+\boldsymbol{E}) \tilde{\boldsymbol{Q}}_{k-1}, \quad \boldsymbol{E}= \tilde{\boldsymbol{Q}}_{k-1}\left(a_{i+1, i}^{(k)} \boldsymbol{e}_{i+1} \boldsymbol{e}_{i}^{T}\right) \tilde{\boldsymbol{Q}}_{k-1}^{*} .$	$\hat{\boldsymbol{A}}_{k}=\tilde{ \boldsymbol{Q}}_{k-1}^{*}(\boldsymbol{A}+\boldsymbol{E}) \tilde{\boldsymbol{Q}}_{k-1}, \quad \boldsymbol{E}= \tilde{\boldsymbol{Q}}_{k-1}\left(a_{i+1, i}^{(k)} \boldsymbol{e}_{i+1} \boldsymbol{e}_{i}^{T}\right) \tilde{\boldsymbol{Q}}_{k-1}^{*} .$
lyche-numerical-linear-algebra_EQ0002	22	■ 1.000	\boldsymbol{x}+\boldsymbol{y}:=\left[\begin{array}{c} x_{1}+y_{1} \\ \vdots \\ x_{n}+y_{n} \end{array} \right], \quad a \boldsymbol{x}:=\left[\begin{array}{c} a x_{1} \\ \vdots \\ a x_{n} \end{array}\right], \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n}, \quad a \in \mathbb{R} .	$\boldsymbol{x}+\boldsymbol{y}:=\left[\begin{array}{c} x_{1}+y_{1} \\ \vdots \\ x_{n}+y_{n} \end{array} \right], \quad a \boldsymbol{x}:=\left[\begin{array}{c} a x_{1} \\ \vdots \\ a x_{n} \end{array}\right], \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n}, \quad a \in \mathbb{R} .$	$\boldsymbol{x}+\boldsymbol{y}:=\left[\begin{array}{c} x_{1}+y_{1} \\ \vdots \\ x_{n}+y_{n} \end{array} \right], \quad a \boldsymbol{x}:=\left[\begin{array}{c} a x_{1} \\ \vdots \\ a x_{n} \end{array}\right], \quad \boldsymbol{x}, \boldsymbol{y} \in \mathbb{R}^{n}, \quad a \in \mathbb{R} .$
lyche-numerical-linear-algebra_EQ0004	22	■ 1.000	\boldsymbol{a}_{: j}:=\left[\begin{array}{c} a_{1 j} \\ a_{2 j} \\ \vdots \\ a_{m j} \end{array}\right], \quad \boldsymbol{a}_{i:}^{T}:=\left[a_{i 1}, a_{i 2}, \ldots, a_{i n}\right], \quad \boldsymbol{A}=\left[\boldsymbol{a}_{: 1}, \boldsymbol{a}_{: 2}, \ldots \boldsymbol{a}_{: n}\right]=\left[\begin{array}{c} \boldsymbol{a}_{1:}^{T} \\ \boldsymbol{a}_{2:}^{T} \\ \vdots \\ \boldsymbol{a}_{m:}^{T} \end{array}\right]	$\boldsymbol{a}_{: j}:=\left[\begin{array}{c} a_{1 j} \\ a_{2 j} \\ \vdots \\ a_{m j} \end{array}\right], \quad \boldsymbol{a}_{i:}^{T}:=\left[a_{i 1}, a_{i 2}, \ldots, a_{i n}\right], \quad \boldsymbol{A}=\left[\boldsymbol{a}_{: 1}, \boldsymbol{a}_{: 2}, \ldots \boldsymbol{a}_{: n}\right]=\left[\begin{array}{c} \boldsymbol{a}_{1:}^{T} \\ \boldsymbol{a}_{2:}^{T} \\ \vdots \\ \boldsymbol{a}_{m:}^{T} \end{array}\right]$	$\boldsymbol{a}_{: j}:=\left[\begin{array}{c} a_{1 j} \\ a_{2 j} \\ \vdots \\ a_{m j} \end{array}\right], \quad \boldsymbol{a}_{i:}^{T}:=\left[a_{i 1}, a_{i 2}, \ldots, a_{i n}\right], \quad \boldsymbol{A}=\left[\boldsymbol{a}_{: 1}, \boldsymbol{a}_{: 2}, \ldots \boldsymbol{a}_{: n}\right]=\left[\begin{array}{c} \boldsymbol{a}_{1:}^{T} \\ \boldsymbol{a}_{2:}^{T} \\ \vdots \\ \boldsymbol{a}_{m:}^{T} \end{array}\right]$

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lyche-numerical-linear-algebra_EQ0005	22	1.000	`e^{x}=e^{a+i b}:=e^{a}(\cos b+i \sin b) .`	$e^{x}=e^{a+ib}:=e^{a}(\cos b+i \sin b)$.	$e^{x}=e^{a+ib}:=e^{a}(\cos b+i \sin b)$.
lyche-numerical-linear-algebra_EQ0006	22	1.000	`e^{i \pi / 2}=i, \quad e^{i \pi}=-1, \quad e^{2 i \pi}=1 .`	$e^{i\pi/2}=i, \quad e^{i\pi}=-1, \quad e^{2i\pi}=1$.	$e^{i\pi/2}=i, \quad e^{i\pi}=-1, \quad e^{2i\pi}=1$.
lyche-numerical-linear-algebra_EQ0007	23	1.000	`x=a+i b=r e^{i \theta}, \quad r=|x|=\sqrt{a^{2}+b^{2}}, \quad \cos \theta=\frac{a}{r}, \quad \sin \theta= \frac{b}{r} .`	$x=a+ib=re^{i\theta}, \quad r=\|x\|=\sqrt{a^2+b^2}, \quad \cos\theta=\frac{a}{r}, \quad \sin\theta=\frac{b}{r}$.	$x=a+ib=re^{i\theta}, \quad r=\|x\|=\sqrt{a^2+b^2}, \quad \cos\theta=\frac{a}{r}, \quad \sin\theta=\frac{b}{r}$.
lyche-numerical-linear-algebra_EQ0014 (1.2)	25	1.000	`p(t):=a_{0}+a_{1} t+a_{2} t^{2}+\cdots+a_{n} t^{n},`	$p(t):=a_0+a_1t+a_2t^2+\cdots+a_nt^n$,	$p(t):=a_0+a_1t+a_2t^2+\cdots+a_nt^n$,
lyche-numerical-linear-algebra_EQ0017 (1.5)	28	1.000	`\mathcal{S} \cap \mathcal{T}:=\{\boldsymbol{x}: \boldsymbol{x} \in \mathcal{S} \text { and } \boldsymbol{x} \in \mathcal{T}\} .`	$\mathcal{S}\cap\mathcal{T}:=\{\boldsymbol{x}:\boldsymbol{x}\in\mathcal{S}\text{ and }\boldsymbol{x}\in\mathcal{T}\}$.	$\mathcal{S}\cap\mathcal{T}:=\{\boldsymbol{x}:\boldsymbol{x}\in\mathcal{S}\text{ and }\boldsymbol{x}\in\mathcal{T}\}$.
lyche-numerical-linear-algebra_EQ0018 (1.6)	28	1.000	`\mathcal{S} \cup \mathcal{T}:=\{\boldsymbol{x}: \boldsymbol{x} \in \mathcal{S} \text { or } \boldsymbol{x} \in \mathcal{T}\} .`	$\mathcal{S}\cup\mathcal{T}:=\{\boldsymbol{x}:\boldsymbol{x}\in\mathcal{S}\text{ or }\boldsymbol{x}\in\mathcal{T}\}$.	$\mathcal{S}\cup\mathcal{T}:=\{\boldsymbol{x}:\boldsymbol{x}\in\mathcal{S}\text{ or }\boldsymbol{x}\in\mathcal{T}\}$.
lyche-numerical-linear-algebra_EQ0020 (1.8)	29	1.000	`\operatorname{dim}(\mathcal{S} \oplus \mathcal{T})= \operatorname{dim}(\mathcal{S})+\operatorname{dim}( \mathcal{T}) .`	$\operatorname{dim}(\mathcal{S}\oplus\mathcal{T})=\operatorname{dim}(\mathcal{S})+\operatorname{dim}(\mathcal{T})$.	$\operatorname{dim}(\mathcal{S}\oplus\mathcal{T})=\operatorname{dim}(\mathcal{S})+\operatorname{dim}(\mathcal{T})$.
lyche-numerical-linear-algebra_EQ0021	29	1.000	`\left\{\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{p}, \boldsymbol{s}_{1}, \ldots, \boldsymbol{s}_{q}, \boldsymbol{t}_{1}, \ldots, \boldsymbol{t}_{r}\right \}`	$\{\boldsymbol{u}_1,\ldots,\boldsymbol{u}_p,\boldsymbol{s}_1,\ldots,\boldsymbol{s}_q,\boldsymbol{t}_1,\ldots,\boldsymbol{t}_r\}$	$\{\boldsymbol{u}_1,\ldots,\boldsymbol{u}_p,\boldsymbol{s}_1,\ldots,\boldsymbol{s}_q,\boldsymbol{t}_1,\ldots,\boldsymbol{t}_r\}$
lyche-numerical-linear-algebra_EQ0022	29	1.000	`\left\{\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{p}, \boldsymbol{s}_{1}, \ldots, \boldsymbol{s}_{q}\right\}`	$\{\boldsymbol{u}_1,\ldots,\boldsymbol{u}_p,\boldsymbol{s}_1,\ldots,\boldsymbol{s}_q\}$	$\{\boldsymbol{u}_1,\ldots,\boldsymbol{u}_p,\boldsymbol{s}_1,\ldots,\boldsymbol{s}_q\}$
lyche-numerical-linear-algebra_EQ0023	29	1.000	`\operatorname{dim}(\mathcal{S}+ \mathcal{T})=p+q+r=(p+q)+(p+r)-p=\operatorname{dim}( \mathcal{S})+\operatorname{dim}(\mathcal{T})- \operatorname{dim}(\mathcal{S} \cap \mathcal{T})`	$\operatorname{dim}(\mathcal{S}+\mathcal{T})=p+q+r=(p+q)+(p+r)-p=\operatorname{dim}(\mathcal{S})+\operatorname{dim}(\mathcal{T})-\operatorname{dim}(\mathcal{S}\cap\mathcal{T})$	$\operatorname{dim}(\mathcal{S}+\mathcal{T})=p+q+r=(p+q)+(p+r)-p=\operatorname{dim}(\mathcal{S})+\operatorname{dim}(\mathcal{T})-\operatorname{dim}(\mathcal{S}\cap\mathcal{T})$
lyche-numerical-linear-algebra_EQ0026	30	1.000	`\mathcal{R}(\boldsymbol{X}):=\left\{\boldsymbol{X} \boldsymbol{c}: \boldsymbol{c} \in \mathbb{R}^{n}\right \}=\operatorname{span}(\mathcal{X}) .`	$\mathcal{R}(\boldsymbol{X}):=\{\boldsymbol{X}\boldsymbol{c}:\boldsymbol{c}\in\mathbb{R}^n\}=\operatorname{span}(\mathcal{X})$.	$\mathcal{R}(\boldsymbol{X}):=\{\boldsymbol{X}\boldsymbol{c}:\boldsymbol{c}\in\mathbb{R}^n\}=\operatorname{span}(\mathcal{X})$.
lyche-numerical-linear-algebra_EQ0030	31	1.000	`x_{1} \boldsymbol{a}_{1}+x_{2} \boldsymbol{a}_{2}+ \cdots+x_{n} \boldsymbol{a}_{n}=\boldsymbol{b},`	$x_1\boldsymbol{a}_1+x_2\boldsymbol{a}_2+\cdots+x_n\boldsymbol{a}_n=\boldsymbol{b}$,	$x_1\boldsymbol{a}_1+x_2\boldsymbol{a}_2+\cdots+x_n\boldsymbol{a}_n=\boldsymbol{b}$,
lyche-numerical-linear-algebra_EQ0035 (1.12)	35	1.000	`\operatorname{det}(\boldsymbol{A})=\sum_{\sigma \in S_{n}} \operatorname{sign}(\sigma) a_{\sigma(1), 1} a_{ \sigma(2), 2} \cdots a_{\sigma(n), n}`	$\operatorname{det}(\boldsymbol{A})=\sum_{\sigma\in S_n}\operatorname{sign}(\sigma)a_{\sigma(1),1}a_{\sigma(2),2}\cdots a_{\sigma(n),n}$	$\operatorname{det}(\boldsymbol{A})=\sum_{\sigma\in S_n}\operatorname{sign}(\sigma)a_{\sigma(1),1}a_{\sigma(2),2}\cdots a_{\sigma(n),n}$.
lyche-numerical-linear-algebra_EQ0036	35	1.000	`\left|\begin{array}{cccc} a_{11} & a_{12} & \cdots & a_{1 n} \\ a_{21} & a_{22} & \cdots & a_{2 n} \\ \vdots & \vdots & & \vdots \\ a_{n 1} & a_{n 2} & \cdots & a_{n n} \end{array}\right| .`	$\begin{vmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{vmatrix}$.	$\begin{vmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{vmatrix}$.
lyche-numerical-linear-algebra_EQ0037	35	1.000	`\left|\begin{array}{ll} a_{11} & a_{12} \\ a_{21} & a_{22} \end{array}\right|=a_{11} a_{22}-a_{21} a_{12} .`	$\begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix}=a_{11}a_{22}-a_{21}a_{12}$.	$\begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix}=a_{11}a_{22}-a_{21}a_{12}$.
lyche-numerical-linear-algebra_EQ0039 (1.13)	36	1.000	`\operatorname{det}(\boldsymbol{B})=\operatorname{det}( \boldsymbol{A}) .`	$\operatorname{det}(\boldsymbol{B})=\operatorname{det}(\boldsymbol{A})$.	$\operatorname{det}(\boldsymbol{B})=\operatorname{det}(\boldsymbol{A})$.

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lyche-numerical-linear-algebra_EQ0041	36	1.000	`\operatorname{det}(\boldsymbol{A}):=\left|\begin{array}{ccc} 1 & x & y \\ 1 & x_{1} & y_{1} \\ 1 & x_{2} & y_{2} \end{array}\right|=0`	$\operatorname{det}(\boldsymbol{A}):=\left\|\begin{array}{ccc} 1 & x & y \\ 1 & x_{1} & y_{1} \\ 1 & x_{2} & y_{2} \end{array}\right\|=0$	$\operatorname{det}(\boldsymbol{A}):=\left\|\begin{array}{ccc} 1 & x & y \\ 1 & x_{1} & y_{1} \\ 1 & x_{2} & y_{2} \end{array}\right\|=0$
lyche-numerical-linear-algebra_EQ0043	36	1.000	`y-y_{1}=\frac{y_{2}-y_{1}}{x_{2}-x_{1}}\left(x-x_{1}\right)`	$y-y_{1}=\frac{y_{2}-y_{1}}{x_{2}-x_{1}}\left(x-x_{1}\right)$	$y-y_{1}=\frac{y_{2}-y_{1}}{x_{2}-x_{1}}\left(x-x_{1}\right)$
lyche-numerical-linear-algebra_EQ0044	37	1.000	`x_{j}=\frac{\operatorname{det}\left(\boldsymbol{A}_{j}(\boldsymbol{b})\right)}{\operatorname{det}(\boldsymbol{A})}, \quad j=1,2, \ldots, n,`	$x_{j}=\frac{\operatorname{det}\left(\boldsymbol{A}_{j}(\boldsymbol{b})\right)}{\operatorname{det}(\boldsymbol{A})}, \quad j=1,2, \ldots, n,$	$x_{j}=\frac{\operatorname{det}\left(\boldsymbol{A}_{j}(\boldsymbol{b})\right)}{\operatorname{det}(\boldsymbol{A})}, \quad j=1,2, \ldots, n,$
lyche-numerical-linear-algebra_EQ0045	37	1.000	`\boldsymbol{A}^{-1}=\frac{1}{\operatorname{det}(\boldsymbol{A})} \operatorname{adj}(\boldsymbol{A}),`	$\boldsymbol{A}^{-1}=\frac{1}{\operatorname{det}(\boldsymbol{A})} \operatorname{adj}(\boldsymbol{A}),$	$\boldsymbol{A}^{-1}=\frac{1}{\operatorname{det}(\boldsymbol{A})} \operatorname{adj}(\boldsymbol{A}),$
lyche-numerical-linear-algebra_EQ0048	38	1.000	`\operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I})=\left|\begin{array}{ccc} a_{11}-\lambda & a_{12} & a_{13} \\ a_{21} & a_{22}-\lambda & a_{23} \\ a_{31} & a_{32} & a_{33}-\lambda \end{array}\right| .`	$\operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I})=\left\|\begin{array}{ccc} a_{11}-\lambda & a_{12} & a_{13} \\ a_{21} & a_{22}-\lambda & a_{23} \\ a_{31} & a_{32} & a_{33}-\lambda \end{array}\right\| .$	$\operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I})=\left\|\begin{array}{ccc} a_{11}-\lambda & a_{12} & a_{13} \\ a_{21} & a_{22}-\lambda & a_{23} \\ a_{31} & a_{32} & a_{33}-\lambda \end{array}\right\| .$
lyche-numerical-linear-algebra_EQ0050 (1.16)	38	1.000	`\operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I})=\left(a_{11}-\lambda\right)\left(a_{22}-\lambda\right) \cdots\left(a_{n n}-\lambda\right)+r(\lambda),`	$\operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I})=\left(a_{11}-\lambda\right)\left(a_{22}-\lambda\right) \cdots\left(a_{n n}-\lambda\right)+r(\lambda),$	$\operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I})=\left(a_{11}-\lambda\right)\left(a_{22}-\lambda\right) \cdots\left(a_{n n}-\lambda\right)+r(\lambda),$
lyche-numerical-linear-algebra_EQ0051 (1.17)	39	1.000	`\operatorname{trace}(\boldsymbol{A})=\lambda_{1}+\lambda_{2}+\cdots+\lambda_{n}, \quad \operatorname{det}(\boldsymbol{A})=\lambda_{1} \lambda_{2} \cdots \lambda_{n},`	$\operatorname{trace}(\boldsymbol{A})=\lambda_{1}+\lambda_{2}+\cdots+\lambda_{n}, \quad \operatorname{det}(\boldsymbol{A})=\lambda_{1} \lambda_{2} \cdots \lambda_{n},$	$\operatorname{trace}(\boldsymbol{A})=\lambda_{1}+\lambda_{2}+\cdots+\lambda_{n}, \quad \operatorname{det}(\boldsymbol{A})=\lambda_{1} \lambda_{2} \cdots \lambda_{n},$
lyche-numerical-linear-algebra_EQ0052 (1.18)	39	1.000	`\operatorname{trace}(\boldsymbol{A}):=a_{11}+a_{22}+\cdots+a_{n n} .`	$\operatorname{trace}(\boldsymbol{A}):=a_{11}+a_{22}+\cdots+a_{n n} .$	$\operatorname{trace}(\boldsymbol{A}):=a_{11}+a_{22}+\cdots+a_{n n} .$
lyche-numerical-linear-algebra_EQ0054	39	1.000	`\pi_{A}(\lambda)=\left(\lambda_{1}-\lambda\right) \cdots\left(\lambda_{n}-\lambda\right)=(-1)^{n} \lambda^{n}+d_{n-1} \lambda^{n-1}+\cdots+d_{0},`	$\pi_{A}(\lambda)=\left(\lambda_{1}-\lambda\right) \cdots\left(\lambda_{n}-\lambda\right)=(-1)^{n} \lambda^{n}+d_{n-1} \lambda^{n-1}+\cdots+d_{0},$	$\pi_{A}(\lambda)=\left(\lambda_{1}-\lambda\right) \cdots\left(\lambda_{n}-\lambda\right)=(-1)^{n} \lambda^{n}+d_{n-1} \lambda^{n-1}+\cdots+d_{0},$
lyche-numerical-linear-algebra_EQ0055 (1.19)	39	1.000	`\lambda^{2}-\operatorname{trace}(\boldsymbol{A}) \lambda+\operatorname{det}(\boldsymbol{A})=0 .`	$\lambda^{2}-\operatorname{trace}(\boldsymbol{A}) \lambda+\operatorname{det}(\boldsymbol{A})=0 .$	$\lambda^{2}-\operatorname{trace}(\boldsymbol{A}) \lambda+\operatorname{det}(\boldsymbol{A})=0 .$
lyche-numerical-linear-algebra_EQ0056	40	1.000	`\left[\begin{array}{ll} W & X \\ Y & Z \end{array}\right]=\left[\begin{array}{ll} A & B \\ C & D \end{array}\right]\left[\begin{array}{ll} E & F \\ G & H \end{array}\right],`	$\left[\begin{array}{ll} W & X \\ Y & Z \end{array}\right]=\left[\begin{array}{ll} A & B \\ C & D \end{array}\right]\left[\begin{array}{ll} E & F \\ G & H \end{array}\right],$	$\left[\begin{array}{ll} W & X \\ Y & Z \end{array}\right]=\left[\begin{array}{ll} A & B \\ C & D \end{array}\right]\left[\begin{array}{ll} E & F \\ G & H \end{array}\right],$
lyche-numerical-linear-algebra_EQ0059	41	1.000	`A=\left[\begin{array}{cc} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{array}\right] .`	$A=\left[\begin{array}{cc} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{array}\right] .$	$A=\left[\begin{array}{cc} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0063	42	1.000	`\left[\begin{array}{ll} 1 & 2 \\ 2 & 1 \end{array}\right] \left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right]= \left[\begin{array}{l} 3 \\ 6 \end{array}\right]`	$\left[\begin{array}{ll} 1 & 2 \\ 2 & 1 \end{array}\right] \left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right]= \left[\begin{array}{l} 3 \\ 6 \end{array}\right]$	$\left[\begin{array}{ll} 1 & 2 \\ 2 & 1 \end{array}\right] \left[\begin{array}{l} x_{1} \\ x_{2} \end{array}\right]= \left[\begin{array}{l} 3 \\ 6 \end{array}\right]$
lyche-numerical-linear-algebra_EQ0065	42	1.000	`\operatorname{adj}(\boldsymbol{A})=\left[\begin{array}{ccc} 14 & 21 & 42 \\ -42 & -14 & 21 \\ 21 & -42 & 14 \end{array}\right] .`	$\operatorname{adj}(\boldsymbol{A})=\left[\begin{array}{ccc} 14 & 21 & 42 \\ -42 & -14 & 21 \\ 21 & -42 & 14 \end{array}\right] .$	$\operatorname{adj}(\boldsymbol{A})=\left[\begin{array}{ccc} 14 & 21 & 42 \\ -42 & -14 & 21 \\ 21 & -42 & 14 \end{array}\right] .$

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lyche-numerical-linear-algebra_EQ0066	42	1.000	`\operatorname{adj}(\boldsymbol{A}) \boldsymbol{A}=\left[ \begin{array}{ccc} 343 & 0 & 0 \\ 0 & 343 & 0 \\ 0 & 0 & 343 \end{array}\right]=\operatorname{det}(\boldsymbol{A}) \boldsymbol{I} .`	$\operatorname{adj}(\boldsymbol{A})\boldsymbol{A}=\left[\begin{array}{ccc} 343 & 0 & 0 \\ 0 & 343 & 0 \\ 0 & 0 & 343 \end{array}\right]=\operatorname{det}(\boldsymbol{A})\boldsymbol{I}.$	$\operatorname{adj}(\boldsymbol{A})\boldsymbol{A}=\left[\begin{array}{ccc} 343 & 0 & 0 \\ 0 & 343 & 0 \\ 0 & 0 & 343 \end{array}\right]=\operatorname{det}(\boldsymbol{A})\boldsymbol{I}.$
lyche-numerical-linear-algebra_EQ0067	42	1.000	`\left|\begin{array}{llll} x & y & z & 1 \\ x_{1} & y_{1} & z_{1} & 1 \\ x_{2} & y_{2} & z_{2} & 1 \\ x_{3} & y_{3} & z_{3} & 1 \end{array}\right|=0`	$\left\|\begin{array}{llll} x & y & z & 1 \\ x_{1} & y_{1} & z_{1} & 1 \\ x_{2} & y_{2} & z_{2} & 1 \\ x_{3} & y_{3} & z_{3} & 1 \end{array}\right\|=0$	$\left\|\begin{array}{llll} x & y & z & 1 \\ x_{1} & y_{1} & z_{1} & 1 \\ x_{2} & y_{2} & z_{2} & 1 \\ x_{3} & y_{3} & z_{3} & 1 \end{array}\right\|=0.$
lyche-numerical-linear-algebra_EQ0068	43	1.000	`A(T)=\frac{1}{2}\left|\begin{array}{ccc} 1 & 1 & 1 \\ x_{1} & x_{2} & x_{3} \\ y_{1} & y_{2} & y_{3} \end{array}\right| .`	$A(T)=\frac{1}{2}\left\|\begin{array}{ccc} 1 & 1 & 1 \\ x_{1} & x_{2} & x_{3} \\ y_{1} & y_{2} & y_{3} \end{array}\right\| .$	$A(T)=\frac{1}{2}\left\|\begin{array}{ccc} 1 & 1 & 1 \\ x_{1} & x_{2} & x_{3} \\ y_{1} & y_{2} & y_{3} \end{array}\right\| .$
lyche-numerical-linear-algebra_EQ0069	43	1.000	`\left|\begin{array}{ccccc} 1 & x_{1} & x_{1}^{2} & \cdots & x_{1}^{n-1} \\ 1 & x_{2} & x_{2}^{2} & \cdots & x_{2}^{n-1} \\ \vdots & \vdots & \vdots & & \vdots \\ 1 & x_{n} & x_{n}^{2} & \cdots & x_{n}^{n-1} \end{array}\right|=\prod_{i>j}\left(x_{i}-x_{j}\right),`	$\left\|\begin{array}{ccccc} 1 & x_{1} & x_{1}^{2} & \cdots & x_{1}^{n-1} \\ 1 & x_{2} & x_{2}^{2} & \cdots & x_{2}^{n-1} \\ \vdots & \vdots & \vdots & & \vdots \\ 1 & x_{n} & x_{n}^{2} & \cdots & x_{n}^{n-1} \end{array}\right\|=\prod_{i>j}\left(x_{i}-x_{j}\right),$	$\left\|\begin{array}{ccccc} 1 & x_{1} & x_{1}^{2} & \cdots & x_{1}^{n-1} \\ 1 & x_{2} & x_{2}^{2} & \cdots & x_{2}^{n-1} \\ \vdots & \vdots & \vdots & & \vdots \\ 1 & x_{n} & x_{n}^{2} & \cdots & x_{n}^{n-1} \end{array}\right\|=\prod_{i>j}\left(x_{i}-x_{j}\right),$
lyche-numerical-linear-algebra_EQ0070	43	1.000	`\operatorname{det}(\boldsymbol{A})=P g(\boldsymbol{\alpha}) g(\boldsymbol{\beta})`	$\operatorname{det}(\boldsymbol{A})=P g(\boldsymbol{\alpha}) g(\boldsymbol{\beta})$	$\operatorname{det}(\boldsymbol{A})=P g(\boldsymbol{\alpha}) g(\boldsymbol{\beta})$
lyche-numerical-linear-algebra_EQ0071	44	1.000	`g(\boldsymbol{\gamma})=\prod_{i=2}^{n}\left(\gamma_{i}-\gamma_{1}\right)\left(\gamma_{i}-\gamma_{2}\right)\cdots\left(\gamma_{i}-\gamma_{i-1}\right)`	$g(\boldsymbol{\gamma})=\prod_{i=2}^{n}\left(\gamma_{i}-\gamma_{1}\right)\left(\gamma_{i}-\gamma_{2}\right)\cdots\left(\gamma_{i}-\gamma_{i-1}\right)$	$g(\boldsymbol{\gamma})=\prod_{i=2}^{n}\left(\gamma_{i}-\gamma_{1}\right)\left(\gamma_{i}-\gamma_{2}\right)\cdots\left(\gamma_{i}-\gamma_{i-1}\right)$
lyche-numerical-linear-algebra_EQ0072	44	1.000	`q(\boldsymbol{\alpha}, \boldsymbol{\beta})=k g(\boldsymbol{\alpha}) g(\boldsymbol{\beta})`	$q(\boldsymbol{\alpha}, \boldsymbol{\beta})=k g(\boldsymbol{\alpha}) g(\boldsymbol{\beta})$	$q(\boldsymbol{\alpha}, \boldsymbol{\beta})=k g(\boldsymbol{\alpha}) g(\boldsymbol{\beta})$
lyche-numerical-linear-algebra_EQ0074	44	1.000	`A_{k}(x)=\prod_{s \neq k}\left(\frac{\alpha_{s}-x}{\alpha_{s}-\alpha_{k}}\right), \quad B_{k}(x)=\prod_{s \neq k}\left(\frac{\beta_{s}-x}{\beta_{s}-\beta_{k}}\right) .`	$A_{k}(x)=\prod_{s \neq k}\left(\frac{\alpha_{s}-x}{\alpha_{s}-\alpha_{k}}\right), \quad B_{k}(x)=\prod_{s \neq k}\left(\frac{\beta_{s}-x}{\beta_{s}-\beta_{k}}\right) .$	$A_{k}(x)=\prod_{s \neq k}\left(\frac{\alpha_{s}-x}{\alpha_{s}-\alpha_{k}}\right), \quad B_{k}(x)=\prod_{s \neq k}\left(\frac{\beta_{s}-x}{\beta_{s}-\beta_{k}}\right) .$
lyche-numerical-linear-algebra_EQ0075	44	1.000	`t_{i, j}^{n}=\frac{f(i) f(j)}{i+j-1},`	$t_{i, j}^{n}=\frac{f(i) f(j)}{i+j-1},$	$t_{i, j}^{n}=\frac{f(i) f(j)}{i+j-1},$
lyche-numerical-linear-algebra_EQ0076	44	1.000	`f(i+1)=\left(\frac{i^{2}-n^{2}}{i^{2}}\right) f(i), \quad i=1,2, \ldots, \quad f(1)=-n .`	$f(i+1)=\left(\frac{i^{2}-n^{2}}{i^{2}}\right) f(i), \quad i=1,2, \ldots, \quad f(1)=-n .$	$f(i+1)=\left(\frac{i^{2}-n^{2}}{i^{2}}\right) f(i), \quad i=1,2, \ldots, \quad f(1)=-n .$
lyche-numerical-linear-algebra_EQ0077 (2.1)	46	1.000	`x_{i}=a+\frac{i-1}{n}(b-a), \quad i=1,2, \ldots, n+1`	$x_{i}=a+\frac{i-1}{n}(b-a), \quad i=1,2, \ldots, n+1$	$x_{i}=a+\frac{i-1}{n}(b-a), \quad i=1,2, \ldots, n+1$
lyche-numerical-linear-algebra_EQ0079 (2.3)	47	1.000	`g(x)=y_{1}+\frac{y_{2}-y_{1}}{x_{2}-x_{1}}\left(x-x_{1}\right),`	$g(x)=y_{1}+\frac{y_{2}-y_{1}}{x_{2}-x_{1}}\left(x-x_{1}\right),$	$g(x)=y_{1}+\frac{y_{2}-y_{1}}{x_{2}-x_{1}}\left(x-x_{1}\right),$
lyche-numerical-linear-algebra_EQ0080	47	1.000	`f(x)=\arctan (10 x)+\pi / 2, \quad x \in[-1,1] .`	$f(x)=\arctan(10 x)+\pi / 2, \quad x \in[-1,1] .$	$f(x)=\arctan(10 x)+\pi / 2, \quad x \in[-1,1] .$

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lyche-numerical-linear-algebra_EQ0082 (2.5)	49	1.000	`g(x):= \begin{cases}p_{1}(x)=-\frac{1}{2} x+\frac{3}{2} x^{3}, & \text { if } 0 \leq x<1, \\ p_{2}(x)=1+4(x-1)+ \frac{9}{2}(x-1)^{2}+\frac{13}{2}(x-1)^{3}, & \text { if } 1 \leq x \leq 2,\end{cases}`	$g(x) := \begin{cases} p_1(x) = -\frac{1}{2}x + \frac{3}{2}x^3, & \text{if } 0 \leq x < 1, \\ p_2(x) = 1 + 4(x-1) + \frac{9}{2}(x-1)^2 + \frac{13}{2}(x-1)^3, & \text{if } 1 \leq x \leq 2, \end{cases}$	$g(x) := \begin{cases} p_1(x) = -\frac{1}{2}x + \frac{3}{2}x^3, & \text{if } 0 \leq x < 1, \\ p_2(x) = 1 + 4(x-1) + \frac{9}{2}(x-1)^2 + \frac{13}{2}(x-1)^3, & \text{if } 1 \leq x \leq 2, \end{cases}$
lyche-numerical-linear-algebra_EQ0083	49	1.000	`p_{i-1}^{(j)}\left(x_{i}\right)=p_{i}^{(j)}\left(x_{i} \right), \quad j=0,1,2, \quad i=2, \ldots, n .`	$p_{i-1}^{(j)}\left(x_i\right)=p_i^{(j)}\left(x_i\right), \quad j=0,1,2, \quad i=2, \ldots, n .$	$p_{i-1}^{(j)}(x_i) = p_i^{(j)}(x_i), \quad j = 0, 1, 2, \quad i = 2, \ldots, n.$
lyche-numerical-linear-algebra_EQ0085 (2.7)	50	1.000	`p_{i}(x)=c_{i, 1}+c_{i, 2}\left(x-x_{i}\right)+c_{i, 3} \left(x-x_{i}\right)^{2}+c_{i, 4}\left(x-x_{i}\right)^{3} \quad i=1, \ldots, n,`	$p_i(x)=c_{i,1}+c_{i,2}\left(x-x_i\right)+c_{i,3}\left(x-x_i\right)^2+c_{i,4}\left(x-x_i\right)^3 \quad i=1, \ldots, n,$	$p_i(x) = c_{i,1} + c_{i,2}(x - x_i) + c_{i,3}(x - x_i)^2 + c_{i,4}(x - x_i)^3 \quad i = 1, \ldots, n,$
lyche-numerical-linear-algebra_EQ0086 (2.8)	50	1.000	`c_{i 1}=y_{i}, c_{i 2}=\frac{y_{i+1}-y_{i}}{h}- \frac{h}{3} \mu_{i}-\frac{h}{6} \mu_{i+1}, c_{i, 3}= \frac{\mu_{i}}{2}, c_{i, 4}=\frac{\mu_{i+1}-\mu_{i}}{6 h} .`	$c_{i1}=y_i, c_{i2}=\frac{y_{i+1}-y_i}{h}-\frac{h}{3}\mu_i-\frac{h}{6}\mu_{i+1}, c_{i,3}=\frac{\mu_i}{2}, c_{i,4}=\frac{\mu_{i+1}-\mu_i}{6h}.$	$c_{i1} = y_i,\ c_{i2} = \frac{y_{i+1} - y_i}{h} - \frac{h}{3}\mu_i - \frac{h}{6}\mu_{i+1},\ c_{i,3} = \frac{\mu_i}{2},\ c_{i,4} = \frac{\mu_{i+1} - \mu_i}{6h}.$
lyche-numerical-linear-algebra_EQ0088 (2.10)	51	1.000	`\begin{aligned} p_{i-1}^{\prime}\left(x_{i}\right) & =c_{i-1,2}+2 h c_{i-1,3}+3 h^{2} c_{i-1,4} \\ & = \frac{y_{i}-y_{i-1}}{h}-\frac{h}{3} \mu_{i-1}-\frac{h}{6} \mu_{i}+2 h \frac{\mu_{i-1}}{2}+3 h^{2} \frac{\mu_{i}- \mu_{i-1}}{6 h} \\ & =\frac{y_{i}-y_{i-1}}{h}+\frac{h}{6} \mu_{i-1}+\frac{h}{3} \mu_{i} \\ p_{i}^{\prime} \left(x_{i}\right) & =c_{i 2}=\frac{y_{i+1}-y_{i}}{h}- \frac{h}{3} \mu_{i}-\frac{h}{6} \mu_{i+1} . \end{aligned}`	$\begin{aligned} p_{i-1}^{\prime}\left(x_i\right) &= c_{i-1,2} + 2hc_{i-1,3} + 3h^2c_{i-1,4} \\ &= \frac{y_i - y_{i-1}}{h} - \frac{h}{3}\mu_{i-1} - \frac{h}{6}\mu_i + 2h\frac{\mu_{i-1}}{2} + 3h^2\frac{\mu_i - \mu_{i-1}}{6h} \\ &= \frac{y_i - y_{i-1}}{h} + \frac{h}{6}\mu_{i-1} + \frac{h}{3}\mu_i \\ p_i^{\prime}\left(x_i\right) &= c_{i2} = \frac{y_{i+1} - y_i}{h} - \frac{h}{3}\mu_i - \frac{h}{6}\mu_{i+1}. \end{aligned}$	$\begin{aligned} p_{i-1}^{\prime}(x_i) &= c_{i-1,2} + 2hc_{i-1,3} + 3h^2c_{i-1,4} \\ &= \frac{y_i - y_{i-1}}{h} - \frac{h}{3}\mu_{i-1} - \frac{h}{6}\mu_i + 2h\frac{\mu_{i-1}}{2} + 3h^2\frac{\mu_i - \mu_{i-1}}{6h} \\ &= \frac{y_i - y_{i-1}}{h} + \frac{h}{6}\mu_{i-1} + \frac{h}{3}\mu_i \\ p_i^{\prime}(x_i) &= c_{i2} = \frac{y_{i+1} - y_i}{h} - \frac{h}{3}\mu_i - \frac{h}{6}\mu_{i+1}. \end{aligned}$
lyche-numerical-linear-algebra_EQ0090 (2.12)	52	1.000	`\left|a_{i i}\right|>\sum_{j \neq i}\left|a_{i j}\right|, i=1, \ldots, n .`	$\left\|a_{ii}\right\|>\sum_{j \neq i}\left\|a_{ij}\right\|, i=1, \ldots, n.$	$\|a_{ii}\| > \sum_{j \neq i} \|a_{ij}\|,\ i = 1, \ldots, n.$
lyche-numerical-linear-algebra_EQ0091 (2.13)	52	1.000	`\max _{1 \leq i \leq n}\left|x_{i}\right| \leq \max _{1 \leq i \leq n}\left(\frac{\left|b_{i}\right|}{\sigma_{i}} \right), \text { where } \sigma_{i}:=\left|a_{i i} \right|-\sum_{j \neq i}\left|a_{i j}\right| .`	$\max_{1 \leq i \leq n}\left\|x_i\right\| \leq \max_{1 \leq i \leq n}\left(\frac{\left\|b_i\right\|}{\sigma_i}\right), \text{ where } \sigma_i := \left\|a_{ii}\right\| - \sum_{j \neq i}\left\|a_{ij}\right\|.$	$\max_{1 \leq i \leq n} \|x_i\| \leq \max_{1 \leq i \leq n} \left(\frac{\|b_i\|}{\sigma_i}\right),\ \textit{where } \sigma_i := \|a_{ii}\| - \sum_{j \neq i} \|a_{ij}\|.$
lyche-numerical-linear-algebra_EQ0092	52	1.000	`\left|b_{k}\right|=\left|a_{k k} x_{k}+\sum_{j \neq k} a_{k j} x_{j}\right| \geq\left|a_{k k}\right|\left|x_{k} \right|-\sum_{j \neq k}\left|a_{k j}\right|\left|x_{j} \right| \geq\left|x_{k}\right|\left(\left|a_{k k}\right|- \sum_{j \neq k}\left|a_{k j}\right|\right),`	$\left\|b_k\right\|=\left\|a_{kk} x_k+\sum_{j \neq k} a_{kj} x_j\right\| \geq\left\|a_{kk}\right\|\left\|x_k \right\|-\sum_{j \neq k}\left\|a_{kj}\right\|\left\|x_j \right\| \geq\left\|x_k\right\|\left(\left\|a_{kk}\right\|- \sum_{j \neq k}\left\|a_{kj}\right\|\right),$	$\|b_k\| = \|a_{kk}x_k + \sum_{j \neq k} a_{kj}x_j\| \geq \|a_{kk}\|\|x_k\| - \sum_{j \neq k}\|a_{kj}\|\|x_j\| \geq \|x_k\|\big(\|a_{kk}\| - \sum_{j \neq k}\|a_{kj}\|\big),$
lyche-numerical-linear-algebra_EQ0093	52	1.000	`\left[\begin{array}{lll} 4 & 1 & 0 \\ 1 & 4 & 1 \\ 0 & 1 & 4 \end{array}\right]\left[\begin{array}{l} \mu_{2} \\ \mu_{3} \\ \mu_{4} \end{array}\right]=\left[ \begin{array}{c} 2 \\ -6 \\ 2 \end{array}\right] .`	$\left[\begin{array}{lll} 4 & 1 & 0 \\ 1 & 4 & 1 \\ 0 & 1 & 4 \end{array}\right]\left[\begin{array}{l} \mu_2 \\ \mu_3 \\ \mu_4 \end{array}\right]=\left[\begin{array}{c} 2 \\ -6 \\ 2 \end{array}\right].$	$\begin{bmatrix} 4 & 1 & 0 \\ 1 & 4 & 1 \\ 0 & 1 & 4 \end{bmatrix} \begin{bmatrix} \mu_2 \\ \mu_3 \\ \mu_4 \end{bmatrix} = \begin{bmatrix} 2 \\ -6 \\ 2 \end{bmatrix}.$

Identifier	Page	Conf.	LaTeX source	Rendered	Image
lyche-numerical-linear-algebra_EQ0094 (2.14)	53	1.000	`g(x):= \begin{cases}p_{1}(x)=\frac{1}{6} x^{3}, & \text { if } 0 \leq x<1, \\ p_{2}(x)= \frac{1}{6}+\frac{1}{2}(x-1)+\frac{1}{2}(x-1)^{2}- \frac{1}{2}(x-1)^{3}, & \text { if } 1 \leq x<2, \\ p_{3}(x)=\frac{2}{3}-(x-2)^{2}+\frac{1}{2}(x-2)^{3}, & \text { if } 2 \leq x<3, \\ p_{4}(x)= \frac{1}{6}-\frac{1}{2}(x-3)+\frac{1}{2}(x-3)^{2}- \frac{1}{6}(x-3)^{3}, & \text { if } 3 \leq x \leq 4, \end{cases}`	$g(x):=\begin{cases}p_{1}(x)=\frac{1}{6} x^{3}, & \text { if } 0 \leq x<1, \\ p_{2}(x)= \frac{1}{6}+\frac{1}{2}(x-1)+\frac{1}{2}(x-1)^{2}- \frac{1}{2}(x-1)^{3}, & \text { if } 1 \leq x<2, \\ p_{3}(x)=\frac{2}{3}-(x-2)^{2}+\frac{1}{2}(x-2)^{3}, & \text { if } 2 \leq x<3, \\ p_{4}(x)= \frac{1}{6}-\frac{1}{2}(x-3)+\frac{1}{2}(x-3)^{2}- \frac{1}{6}(x-3)^{3}, & \text { if } 3 \leq x \leq 4, \end{cases}$	$g(x):=\begin{cases}p_{1}(x)=\frac{1}{6} x^{3}, & \text { if } 0 \leq x<1, \\ p_{2}(x)= \frac{1}{6}+\frac{1}{2}(x-1)+\frac{1}{2}(x-1)^{2}- \frac{1}{2}(x-1)^{3}, & \text { if } 1 \leq x<2, \\ p_{3}(x)=\frac{2}{3}-(x-2)^{2}+\frac{1}{2}(x-2)^{3}, & \text { if } 2 \leq x<3, \\ p_{4}(x)= \frac{1}{6}-\frac{1}{2}(x-3)+\frac{1}{2}(x-3)^{2}- \frac{1}{6}(x-3)^{3}, & \text { if } 3 \leq x \leq 4, \end{cases}$
lyche-numerical-linear-algebra_EQ0095 (2.15)	54	1.000	`\left[\begin{array}{ccccc} d_{1} & c_{1} & & & \\ a_{1} & d_{2} & c_{2} & & \\ & \ddots & \ddots & \ddots & \\ & & a_{n-2} & d_{n-1} & c_{n-1} \\ & & & a_{n-1} & d_{n} \end{array}\right]=\left[\begin{array}{cccc} 1 & & & \\ l_{1} & 1 & & \\ & \ddots & \ddots & \\ & & l_{n-1} & 1 \end{array}\right]\left[\begin{array}{cccc} u_{1} & c_{1} & & \\ & \ddots & \ddots & \\ & & u_{n-1} & c_{n-1} \\ & & & u_{n} \end{array}\right]`	$\left[\begin{array}{ccccc} d_{1} & c_{1} & & & \\ a_{1} & d_{2} & c_{2} & & \\ & \ddots & \ddots & \ddots & \\ & & a_{n-2} & d_{n-1} & c_{n-1} \\ & & & a_{n-1} & d_{n} \end{array}\right]=\left[\begin{array}{cccc} 1 & & & \\ l_{1} & 1 & & \\ & \ddots & \ddots & \\ & & l_{n-1} & 1 \end{array}\right]\left[\begin{array}{cccc} u_{1} & c_{1} & & \\ & \ddots & \ddots & \\ & & u_{n-1} & c_{n-1} \\ & & & u_{n} \end{array}\right]$	$\left[\begin{array}{ccccc} d_{1} & c_{1} & & & \\ a_{1} & d_{2} & c_{2} & & \\ & \ddots & \ddots & \ddots & \\ & & a_{n-2} & d_{n-1} & c_{n-1} \\ & & & a_{n-1} & d_{n} \end{array}\right]=\left[\begin{array}{cccc} 1 & & & \\ l_{1} & 1 & & \\ & \ddots & \ddots & \\ & & l_{n-1} & 1 \end{array}\right]\left[\begin{array}{cccc} u_{1} & c_{1} & & \\ & \ddots & \ddots & \\ & & u_{n-1} & c_{n-1} \\ & & & u_{n} \end{array}\right].$
lyche-numerical-linear-algebra_EQ0100 (2.17)	55	1.000	`\left|u_{k}\right| \geq \sigma_{k}+\left|c_{k}\right|, \quad \text { where, } \sigma_{k}:=\left|d_{k}\right|- \left|a_{k-1}\right|-\left|c_{k}\right|>0, k=1, \ldots, n,`	$\left\|u_{k}\right\| \geq \sigma_{k}+\left\|c_{k}\right\|, \quad \text { where, } \sigma_{k}:=\left\|d_{k}\right\|- \left\|a_{k-1}\right\|-\left\|c_{k}\right\|>0, k=1, \ldots, n,$	$\left\|u_{k}\right\| \geq \sigma_{k}+\left\|c_{k}\right\|, \quad \text { where, } \sigma_{k}:=\left\|d_{k}\right\|- \left\|a_{k-1}\right\|-\left\|c_{k}\right\|>0, k=1, \ldots, n,$
lyche-numerical-linear-algebra_EQ0104 (2.20)	56	1.000	`-u^{\prime \prime}(x)=f(x), \quad x \in[0,1], \quad u(0)=0, u(1)=0,`	$-u^{\prime \prime}(x)=f(x), \quad x \in[0,1], \quad u(0)=0, u(1)=0,$	$-u^{\prime \prime}(x)=f(x), \quad x \in[0,1], \quad u(0)=0, u(1)=0,$
lyche-numerical-linear-algebra_EQ0105	56	1.000	`g^{\prime}(x)=\lim _{h \rightarrow 0} \frac{g\left(x+ \frac{h}{2}\right)-g\left(x-\frac{h}{2}\right)}{h}`	$g^{\prime}(x)=\lim _{h \rightarrow 0} \frac{g\left(x+ \frac{h}{2}\right)-g\left(x-\frac{h}{2}\right)}{h}$	$g^{\prime}(x)=\lim _{h \rightarrow 0} \frac{g\left(x+ \frac{h}{2}\right)-g\left(x-\frac{h}{2}\right)}{h}$
lyche-numerical-linear-algebra_EQ0107	57	1.000	`\frac{-v_{j-1}+2 v_{j}-v_{j+1}}{h^{2}}=f(j h), \quad j=1, \ldots, m, \quad v_{0}=v_{m+1}=0 .`	$\frac{-v_{j-1}+2 v_{j}-v_{j+1}}{h^{2}}=f(j h), \quad j=1, \ldots, m, \quad v_{0}=v_{m+1}=0 .$	$\frac{-v_{j-1}+2 v_{j}-v_{j+1}}{h^{2}}=f(j h), \quad j=1, \ldots, m, \quad v_{0}=v_{m+1}=0 .$
lyche-numerical-linear-algebra_EQ0109 (2.22)	57	1.000	`\left|a_{i i}\right| \geq \sum_{j \neq i}\left|a_{i j} \right|, i=1, \ldots, n .`	$\left\|a_{i i}\right\| \geq \sum_{j \neq i}\left\|a_{i j}\right\|, i=1, \ldots, n .$	$\left\|a_{i i}\right\| \geq \sum_{j \neq i}\left\|a_{i j}\right\|, i=1, \ldots, n .$
lyche-numerical-linear-algebra_EQ0111 (2.23)	58	1.000	`\left|u_{k+1}\right|=\left|d_{k+1}-l_{k} c_{k}\right|= \left|d_{k+1}-\frac{a_{k} c_{k}}{u_{k}}\right| \geq \left|d_{k+1}\right|-\frac{\left|a_{k}\right|\left|c_{k} \right|}{\left|u_{k}\right|}>\left|d_{k+1}\right|- \left|a_{k}\right| .`	$\left\|u_{k+1}\right\|=\left\|d_{k+1}-l_{k} c_{k}\right\|=\left\|d_{k+1}-\frac{a_{k} c_{k}}{u_{k}}\right\| \geq \left\|d_{k+1}\right\|-\frac{\left\|a_{k}\right\|\left\|c_{k}\right\|}{\left\|u_{k}\right\|}>\left\|d_{k+1}\right\|-\left\|a_{k}\right\| .$	$\left\|u_{k+1}\right\|=\left\|d_{k+1}-l_{k} c_{k}\right\|=\left\|d_{k+1}-\frac{a_{k} c_{k}}{u_{k}}\right\| \geq \left\|d_{k+1}\right\|-\frac{\left\|a_{k}\right\|\left\|c_{k}\right\|}{\left\|u_{k}\right\|}>\left\|d_{k+1}\right\|-\left\|a_{k}\right\| .$
lyche-numerical-linear-algebra_EQ0112 (2.24)	59	1.000	`R y^{\prime \prime}(x)=-F y(x), \quad y(0)=y(L)=0,`	$R y^{\prime \prime}(x)=-F y(x), \quad y(0)=y(L)=0,$	$R y^{\prime \prime}(x)=-F y(x), \quad y(0)=y(L)=0,$
lyche-numerical-linear-algebra_EQ0113 (2.25)	59	1.000	`u^{\prime \prime}(t)=-K u(t), \quad u(0)=u(1)=0, \quad K:=\frac{F L^{2}}{R} .`	$u^{\prime \prime}(t)=-K u(t), \quad u(0)=u(1)=0, \quad K:=\frac{F L^{2}}{R} .$	$u^{\prime \prime}(t)=-K u(t), \quad u(0)=u(1)=0, \quad K:=\frac{F L^{2}}{R} .$
lyche-numerical-linear-algebra_EQ0115	59	1.000	`\frac{-v_{j-1}+2 v_{j}-v_{j+1}}{h^{2}}=K v_{j}, \quad j=1, \ldots, m, h=\frac{1}{m+1}, \quad v_{0}=v_{m+1}=0,`	$\frac{-v_{j-1}+2 v_{j}-v_{j+1}}{h^{2}}=K v_{j}, \quad j=1, \ldots, m, h=\frac{1}{m+1}, \quad v_{0}=v_{m+1}=0,$	$\frac{-v_{j-1}+2 v_{j}-v_{j+1}}{h^{2}}=K v_{j}, \quad j=1, \ldots, m, h=\frac{1}{m+1}, \quad v_{0}=v_{m+1}=0,$

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lyche-numerical-linear-algebra_EQ0116 (2.26)	60	1.000	`\boldsymbol{T} \boldsymbol{v}=\lambda \boldsymbol{v}, \text { with } \boldsymbol{v}=\left[v_{1}, \ldots, v_{m} \right]^{T},`	$\boldsymbol{T}\boldsymbol{v}=\lambda \boldsymbol{v}, \text{ with } \boldsymbol{v}=\left[v_{1}, \ldots, v_{m} \right]^{T},$	$\boldsymbol{T}\boldsymbol{v}=\lambda \boldsymbol{v}, \text{ with } \boldsymbol{v}=\left[v_{1}, \ldots, v_{m} \right]^{T},$
lyche-numerical-linear-algebra_EQ0118	60	1.000	`F=\frac{4 \sin ^{2}(\pi h / 2) R}{h^{2} L^{2}} .`	$F=\frac{4 \sin ^{2}(\pi h / 2) R}{h^{2} L^{2}} .$	$F=\frac{4 \sin ^{2}(\pi h / 2) R}{h^{2} L^{2}} .$
lyche-numerical-linear-algebra_EQ0119 (2.28)	60	1.000	`\boldsymbol{T}_{1}:=\operatorname{tridiag}(a, d, a)`	$\boldsymbol{T}_{1}:=\operatorname{tridiag}(a, d, a)$	$\boldsymbol{T}_{1}:=\operatorname{tridiag}(a, d, a)$
lyche-numerical-linear-algebra_EQ0120 (2.29)	60	1.000	`\boldsymbol{S}=\left[\sin \frac{j k \pi}{m+1}\right]_{j, k=1}^{m} \in \mathbb{R}^{m \times m} .`	$\boldsymbol{S}=\left[\sin \frac{j k \pi}{m+1}\right]_{j, k=1}^{m} \in \mathbb{R}^{m \times m} .$	$\boldsymbol{S}=\left[\sin \frac{j k \pi}{m+1}\right]_{j, k=1}^{m} \in \mathbb{R}^{m \times m} .$
lyche-numerical-linear-algebra_EQ0126	62	1.000	`\sum_{k=0}^{m} \cos (2 k j \pi h)+i \sum_{k=0}^{m} \sin (2 k j \pi h)=\sum_{k=0}^{m} e^{2 i k j \pi h}=\frac{e^{2 i(m+1) j \pi h}-1}{e^{2 i j \pi h}-1}=0,`	$\sum_{k=0}^{m} \cos (2 k j \pi h)+i \sum_{k=0}^{m} \sin (2 k j \pi h)=\sum_{k=0}^{m} e^{2 i k j \pi h}=\frac{e^{2 i(m+1) j \pi h}-1}{e^{2 i j \pi h}-1}=0,$	$\sum_{k=0}^{m} \cos (2 k j \pi h)+i \sum_{k=0}^{m} \sin (2 k j \pi h)=\sum_{k=0}^{m} e^{2 i k j \pi h}=\frac{e^{2 i(m+1) j \pi h}-1}{e^{2 i j \pi h}-1}=0,$
lyche-numerical-linear-algebra_EQ0130	63	1.000	`\boldsymbol{A} \boldsymbol{B}=\left[\boldsymbol{A} \boldsymbol{b}_{: 1}, \boldsymbol{A} \boldsymbol{b}_{: 2}, \ldots, \boldsymbol{A} \boldsymbol{b}_{: n}\right] .`	$\boldsymbol{A}\boldsymbol{B}=\left[\boldsymbol{A}\boldsymbol{b}_{:1}, \boldsymbol{A}\boldsymbol{b}_{:2}, \ldots, \boldsymbol{A}\boldsymbol{b}_{:n}\right] .$	$\boldsymbol{A}\boldsymbol{B}=\left[\boldsymbol{A}\boldsymbol{b}_{:1}, \boldsymbol{A}\boldsymbol{b}_{:2}, \ldots, \boldsymbol{A}\boldsymbol{b}_{:n}\right] .$
lyche-numerical-linear-algebra_EQ0131	63	1.000	`\boldsymbol{A}=\boldsymbol{A} \boldsymbol{I}= \boldsymbol{A}\left[\boldsymbol{e}_{1}, \boldsymbol{e}_{2}, \ldots, \boldsymbol{e}_{p} \right]=\left[\boldsymbol{A} \boldsymbol{e}_{1}, \boldsymbol{A} \boldsymbol{e}_{2}, \ldots, \boldsymbol{A} \boldsymbol{e}_{p}\right]`	$\boldsymbol{A}=\boldsymbol{A}\boldsymbol{I}=\boldsymbol{A}\left[\boldsymbol{e}_{1}, \boldsymbol{e}_{2}, \ldots, \boldsymbol{e}_{p}\right]=\left[\boldsymbol{A}\boldsymbol{e}_{1}, \boldsymbol{A}\boldsymbol{e}_{2}, \ldots, \boldsymbol{A}\boldsymbol{e}_{p}\right]$	$\boldsymbol{A}=\boldsymbol{A}\boldsymbol{I}=\boldsymbol{A}\left[\boldsymbol{e}_{1}, \boldsymbol{e}_{2}, \ldots, \boldsymbol{e}_{p}\right]=\left[\boldsymbol{A}\boldsymbol{e}_{1}, \boldsymbol{A}\boldsymbol{e}_{2}, \ldots, \boldsymbol{A}\boldsymbol{e}_{p}\right]$
lyche-numerical-linear-algebra_EQ0133	63	1.000	`\boldsymbol{A} \boldsymbol{x}=x_{1} \boldsymbol{a}_{: 1}+x_{2} \boldsymbol{a}_{: 2}+\cdots+x_{p} \boldsymbol{a}_{: p} .`	$\boldsymbol{A}\boldsymbol{x}=x_{1}\boldsymbol{a}_{:1}+x_{2}\boldsymbol{a}_{:2}+\cdots+x_{p}\boldsymbol{a}_{:p}.$	$\boldsymbol{A}\boldsymbol{x}=x_{1}\boldsymbol{a}_{:1}+x_{2}\boldsymbol{a}_{:2}+\cdots+x_{p}\boldsymbol{a}_{:p}.$
lyche-numerical-linear-algebra_EQ0134	64	1.000	`\boldsymbol{A}\left[\boldsymbol{B}_{1}, \boldsymbol{B}_{2}\right]=\left[\boldsymbol{A} \boldsymbol{B}_{1}, \boldsymbol{A} \boldsymbol{B}_{2} \right] .`	$\boldsymbol{A}\left[\boldsymbol{B}_{1}, \boldsymbol{B}_{2}\right]=\left[\boldsymbol{A}\boldsymbol{B}_{1}, \boldsymbol{A}\boldsymbol{B}_{2}\right] .$	$\boldsymbol{A}\left[\boldsymbol{B}_{1}, \boldsymbol{B}_{2}\right]=\left[\boldsymbol{A}\boldsymbol{B}_{1}, \boldsymbol{A}\boldsymbol{B}_{2}\right] .$
lyche-numerical-linear-algebra_EQ0136	64	1.000	`\left[\boldsymbol{A}_{1}, \boldsymbol{A}_{2}\right]\left[ \begin{array}{l} \boldsymbol{B}_{1} \\ \boldsymbol{B}_{2} \end{array}\right]=\left[\boldsymbol{A}_{1} \boldsymbol{B}_{1}+\boldsymbol{A}_{2} \boldsymbol{B}_{2} \right] .`	$\left[\boldsymbol{A}_{1}, \boldsymbol{A}_{2}\right]\left[\begin{array}{l} \boldsymbol{B}_{1} \\ \boldsymbol{B}_{2} \end{array}\right]=\left[\boldsymbol{A}_{1}\boldsymbol{B}_{1}+\boldsymbol{A}_{2}\boldsymbol{B}_{2}\right] .$	$\left[\boldsymbol{A}_{1}, \boldsymbol{A}_{2}\right]\left[\begin{array}{l} \boldsymbol{B}_{1} \\ \boldsymbol{B}_{2} \end{array}\right]=\left[\boldsymbol{A}_{1}\boldsymbol{B}_{1}+\boldsymbol{A}_{2}\boldsymbol{B}_{2}\right] .$
lyche-numerical-linear-algebra_EQ0140	65	1.000	`\boldsymbol{C}_{i j}=\sum_{k=1}^{s} \boldsymbol{A}_{i k} \boldsymbol{B}_{k j}, \quad i=1, \ldots, p, j=1, \ldots, q`	$\boldsymbol{C}_{ij}=\sum_{k=1}^{s} \boldsymbol{A}_{ik} \boldsymbol{B}_{kj}, \quad i=1, \ldots, p, j=1, \ldots, q$	$\boldsymbol{C}_{ij}=\sum_{k=1}^{s} \boldsymbol{A}_{ik} \boldsymbol{B}_{kj}, \quad i=1, \ldots, p, j=1, \ldots, q$

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lyche-numerical-linear-algebra_EQ0141	65	1.000	\left[\begin{array}{ccc} \boldsymbol{A}_{11} & \cdots & \boldsymbol{A}_{1 s} \\ \vdots & & \vdots \\ \boldsymbol{A}_{p 1} & \cdots & \boldsymbol{A}_{p s} \end{array}\right]\left[\begin{array}{ccc} \boldsymbol{B}_{11} & \cdots & \boldsymbol{B}_{1 q} \\ \vdots & & \vdots \\ \boldsymbol{B}_{s 1} & \cdots & \boldsymbol{B}_{s q} \end{array}\right]=\left[\begin{array}{ccc} \boldsymbol{C}_{11} & \cdots & \boldsymbol{C}_{1 q} \\ \vdots & & \vdots \\ \boldsymbol{C}_{p 1} & \cdots & \boldsymbol{C}_{p q} \end{array}\right] .	$\left[\begin{array}{ccc} \boldsymbol{A}_{11} & \cdots & \boldsymbol{A}_{1 s} \\ \vdots & & \vdots \\ \boldsymbol{A}_{p 1} & \cdots & \boldsymbol{A}_{p s} \end{array}\right]\left[\begin{array}{ccc} \boldsymbol{B}_{11} & \cdots & \boldsymbol{B}_{1 q} \\ \vdots & & \vdots \\ \boldsymbol{B}_{s 1} & \cdots & \boldsymbol{B}_{s q} \end{array}\right]=\left[\begin{array}{ccc} \boldsymbol{C}_{11} & \cdots & \boldsymbol{C}_{1 q} \\ \vdots & & \vdots \\ \boldsymbol{C}_{p 1} & \cdots & \boldsymbol{C}_{p q} \end{array}\right] .$	$\left[\begin{array}{ccc} \boldsymbol{A}_{11} & \cdots & \boldsymbol{A}_{1 s} \\ \vdots & & \vdots \\ \boldsymbol{A}_{p 1} & \cdots & \boldsymbol{A}_{p s} \end{array}\right]\left[\begin{array}{ccc} \boldsymbol{B}_{11} & \cdots & \boldsymbol{B}_{1 q} \\ \vdots & & \vdots \\ \boldsymbol{B}_{s 1} & \cdots & \boldsymbol{B}_{s q} \end{array}\right]=\left[\begin{array}{ccc} \boldsymbol{C}_{11} & \cdots & \boldsymbol{C}_{1 q} \\ \vdots & & \vdots \\ \boldsymbol{C}_{p 1} & \cdots & \boldsymbol{C}_{p q} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0143 (2.33)	65	1.000	\boldsymbol{A}^{-1}=\left[\begin{array}{cc} \boldsymbol{A}_{11}^{-1} & \boldsymbol{C} \\ \mathbf{0} & \boldsymbol{A}_{22}^{-1} \end{array}\right],	$\boldsymbol{A}^{-1}=\left[\begin{array}{cc} \boldsymbol{A}_{11}^{-1} & \boldsymbol{C} \\ \mathbf{0} & \boldsymbol{A}_{22}^{-1} \end{array}\right],$	$\boldsymbol{A}^{-1}=\left[\begin{array}{cc} \boldsymbol{A}_{11}^{-1} & \boldsymbol{C} \\ \mathbf{0} & \boldsymbol{A}_{22}^{-1} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0146	66	1.000	\boldsymbol{B}_{12}=\boldsymbol{C}=- \boldsymbol{A}_{11}^{-1} \boldsymbol{A}_{12} \boldsymbol{A}_{22}^{-1} .	$\boldsymbol{B}_{12}=\boldsymbol{C}=-\boldsymbol{A}_{11}^{-1} \boldsymbol{A}_{12} \boldsymbol{A}_{22}^{-1} .$	$\boldsymbol{B}_{12}=\boldsymbol{C}=-\boldsymbol{A}_{11}^{-1} \boldsymbol{A}_{12} \boldsymbol{A}_{22}^{-1} .$
lyche-numerical-linear-algebra_EQ0148	66	1.000	\boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{k} & \boldsymbol{a}_{k} \\ \mathbf{0} & a_{k+1, k+1} \end{array}\right]	$\boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{k} & \boldsymbol{a}_{k} \\ \mathbf{0} & a_{k+1, k+1} \end{array}\right]$	$\boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{k} & \boldsymbol{a}_{k} \\ \mathbf{0} & a_{k+1, k+1} \end{array}\right]$
lyche-numerical-linear-algebra_EQ0149	66	1.000	\boldsymbol{A}^{-1}=\left[\begin{array}{cc} \boldsymbol{A}_{k}^{-1} & \boldsymbol{c} \\ \mathbf{0} & a_{k+1, k+1}^{-1} \end{array}\right],	$\boldsymbol{A}^{-1}=\left[\begin{array}{cc} \boldsymbol{A}_{k}^{-1} & \boldsymbol{c} \\ \mathbf{0} & a_{k+1, k+1}^{-1} \end{array}\right],$	$\boldsymbol{A}^{-1}=\left[\begin{array}{cc} \boldsymbol{A}_{k}^{-1} & \boldsymbol{c} \\ \mathbf{0} & a_{k+1, k+1}^{-1} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0150	67	1.000	\max _{2 \leq j \leq n}\left|\mu_{j}\right| \leq \frac{3}{h^{2}} \max _{2 \leq i \leq n}\left|y_{i+1}-2 y_{i}+y_{i-1}\right| .	$\max_{2 \leq j \leq n}\left\|\mu_{j}\right\| \leq \frac{3}{h^{2}} \max_{2 \leq i \leq n}\left\|y_{i+1}-2 y_{i}+y_{i-1}\right\| .$	$\max_{2 \leq j \leq n}\left\|\mu_{j}\right\| \leq \frac{3}{h^{2}} \max_{2 \leq i \leq n}\left\|y_{i+1}-2 y_{i}+y_{i-1}\right\| .$
lyche-numerical-linear-algebra_EQ0151 (2.34)	67	1.000	\left[\begin{array}{ccccc} 2 & 1 & & & \\ 1 & 4 & 1 & & \\ & \ddots & \ddots & \ddots & \\ & & 1 & 4 & 1 \\ & & & 1 & 2 \end{array}\right]\left[\begin{array}{c} \mu_{1} \\ \mu_{2} \\ \vdots \\ \mu_{n} \\ \mu_{n+1} \end{array}\right]=\frac{6}{h^{2}}\left[\begin{array}{c} y_{2}-y_{1}-h s_{1} \\ \delta^{2} y_{2} \\ \delta^{2} y_{3} \\ \vdots \\ \delta^{2} y_{n-1} \\ \delta^{2} y_{n} \\ h s_{n+1}-y_{n+1}+y_{n} \end{array}\right],	$\left[\begin{array}{ccccc} 2 & 1 & & & \\ 1 & 4 & 1 & & \\ & \ddots & \ddots & \ddots & \\ & & 1 & 4 & 1 \\ & & & 1 & 2 \end{array}\right]\left[\begin{array}{c} \mu_{1} \\ \mu_{2} \\ \vdots \\ \mu_{n} \\ \mu_{n+1} \end{array}\right]=\frac{6}{h^{2}}\left[\begin{array}{c} y_{2}-y_{1}-h s_{1} \\ \delta^{2} y_{2} \\ \delta^{2} y_{3} \\ \vdots \\ \delta^{2} y_{n-1} \\ \delta^{2} y_{n} \\ h s_{n+1}-y_{n+1}+y_{n} \end{array}\right],$	$\left[\begin{array}{ccccc} 2 & 1 & & & \\ 1 & 4 & 1 & & \\ & \ddots & \ddots & \ddots & \\ & & 1 & 4 & 1 \\ & & & 1 & 2 \end{array}\right]\left[\begin{array}{c} \mu_{1} \\ \mu_{2} \\ \vdots \\ \mu_{n} \\ \mu_{n+1} \end{array}\right]=\frac{6}{h^{2}}\left[\begin{array}{c} y_{2}-y_{1}-h s_{1} \\ \delta^{2} y_{2} \\ \delta^{2} y_{3} \\ \vdots \\ \delta^{2} y_{n-1} \\ \delta^{2} y_{n} \\ h s_{n+1}-y_{n+1}+y_{n} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0152	68	1.000	\int_{a}^{b}\left(g^{\prime \prime}(x)\right)^{2} d x \leq \int_{a}^{b}\left(h^{\prime \prime}(x)\right)^{2} d x	$\int_{a}^{b}\left(g^{\prime \prime}(x)\right)^{2} d x \leq \int_{a}^{b}\left(h^{\prime \prime}(x)\right)^{2} d x$	$\int_{a}^{b}\left(g^{\prime \prime}(x)\right)^{2} d x \leq \int_{a}^{b}\left(h^{\prime \prime}(x)\right)^{2} d x$
lyche-numerical-linear-algebra_EQ0153 (2.35)	68	1.000	\int_{a}^{b} g^{\prime \prime} e^{\prime \prime}=0, \quad e:=h-g .	$\int_{a}^{b} g^{\prime \prime} e^{\prime \prime}=0, \quad e:=h-g .$	$\int_{a}^{b} g^{\prime \prime} e^{\prime \prime}=0, \quad e:=h-g .$

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lyche-numerical-linear-algebra_EQ0154	68	1.000	`\int_{a}^{b} g^{\prime \prime \prime} e^{\prime}= \sum_{i=1}^{n} \int_{x_{i}}^{x_{i+1}} g^{\prime \prime \prime} e^{\prime}=\sum_{i=1}^{n} v_{i} \int_{x_{i}}^{x_{i+1}} e^{\prime}=\sum_{i=1}^{n} v_{i} \left(e\left(x_{i+1}\right)-e\left(x_{i}\right)\right)=0 .`	$\int_a^b g^{\prime \prime \prime} e^{\prime}=\sum_{i=1}^n \int_{x_i}^{x_{i+1}} g^{\prime \prime \prime} e^{\prime}=\sum_{i=1}^n v_i \int_{x_i}^{x_{i+1}} e^{\prime}=\sum_{i=1}^n v_i\left(e\left(x_{i+1}\right)-e\left(x_i\right)\right)=0 .$	$\int_a^b g^{\prime \prime \prime} e^{\prime}=\sum_{i=1}^n \int_{x_i}^{x_{i+1}} g^{\prime \prime \prime} e^{\prime}=\sum_{i=1}^n v_i \int_{x_i}^{x_{i+1}} e^{\prime}=\sum_{i=1}^n v_i\left(e(x_{i+1})-e(x_i)\right)=0.$
lyche-numerical-linear-algebra_EQ0155	68	1.000	`\begin{aligned} \int_{a}^{b}\left(h^{\prime \prime} \right)^{2} & =\int_{a}^{b}\left(g^{\prime \prime}+e^{ \prime \prime}\right)^{2} \\ & =\int_{a}^{b}\left(g^{ \prime \prime}\right)^{2}+\int_{a}^{b}\left(e^{\prime \prime}\right)^{2}+2 \int_{a}^{b} g^{\prime \prime} e^{\prime \prime} \\ & =\int_{a}^{b}\left(g^{\prime \prime}\right)^{2}+\int_{a}^{b}\left(e^{\prime \prime} \right)^{2} \geq \int_{a}^{b}\left(g^{\prime \prime}\right)^{2} \end{aligned}`	$\begin{aligned} \int_a^b\left(h^{\prime \prime}\right)^2 & =\int_a^b\left(g^{\prime \prime}+e^{\prime \prime}\right)^2 \\ & =\int_a^b\left(g^{\prime \prime}\right)^2+\int_a^b\left(e^{\prime \prime}\right)^2+2 \int_a^b g^{\prime \prime} e^{\prime \prime} \\ & =\int_a^b\left(g^{\prime \prime}\right)^2+\int_a^b\left(e^{\prime \prime}\right)^2 \geq \int_a^b\left(g^{\prime \prime}\right)^2 \end{aligned}$	$\begin{aligned} \int_a^b\left(h^{\prime \prime}\right)^2 & =\int_a^b\left(g^{\prime \prime}+e^{\prime \prime}\right)^2 \\ & =\int_a^b\left(g^{\prime \prime}\right)^2+\int_a^b\left(e^{\prime \prime}\right)^2+2 \int_a^b g^{\prime \prime} e^{\prime \prime} \\ & =\int_a^b\left(g^{\prime \prime}\right)^2+\int_a^b\left(e^{\prime \prime}\right)^2 \geq \int_a^b\left(g^{\prime \prime}\right)^2 \end{aligned}$
lyche-numerical-linear-algebra_EQ0157	71	1.000	`\delta^{2} f(x)=f^{\prime \prime}\left(\eta_{2}\right), \quad x-h<\eta_{2}<x+h .`	$\delta^2 f(x)=f^{\prime \prime}\left(\eta_2\right), \quad x-h<\eta_2<x+h .$	$\delta^2 f(x)=f^{\prime \prime}(\eta_2), \quad x-h<\eta_2<x+h.$
lyche-numerical-linear-algebra_EQ0158	71	1.000	`\delta^{2} f(x)=f^{\prime \prime}(x)+\frac{h^{2}}{12} f^{(4)}\left(\eta_{4}\right), \quad x-h<\eta_{4}<x+h .`	$\delta^2 f(x)=f^{\prime \prime}(x)+\frac{h^2}{12} f^{(4)}\left(\eta_4\right), \quad x-h<\eta_4<x+h .$	$\delta^2 f(x)=f^{\prime \prime}(x)+\frac{h^2}{12} f^{(4)}(\eta_4), \quad x-h<\eta_4<x+h.$
lyche-numerical-linear-algebra_EQ0159 (2.36)	71	1.000	`\begin{aligned} -u^{\prime \prime}(x)+r(x) u^{ \prime}(x)+q(x) u(x) & =f(x), \text { for } x \in[a, b], \\ u(a) & =g_{0}, \quad u(b)=g_{1} . \end{aligned}`	$\begin{aligned} -u^{\prime \prime}(x)+r(x) u^{\prime}(x)+q(x) u(x) & =f(x), \text { for } x \in[a, b], \\ u(a) & =g_0, \quad u(b)=g_1 . \end{aligned}$	$\begin{aligned} -u^{\prime \prime}(x)+r(x) u^{\prime}(x)+q(x) u(x) & =f(x), \text { for } x \in[a, b], \\ u(a) & =g_0, \quad u(b)=g_1 . \end{aligned}$
lyche-numerical-linear-algebra_EQ0160 (2.37)	71	1.000	`\frac{-v_{j-1}+2 v_{j}-v_{j+1}}{h^{2}}+r\left(x_{j} \right) \frac{v_{j+1}-v_{j-1}}{2 h}+q\left(x_{j}\right) v_{j}=f\left(x_{j}\right), \quad j=1, \ldots, m,`	$\frac{-v_{j-1}+2 v_j-v_{j+1}}{h^2}+r\left(x_j\right) \frac{v_{j+1}-v_{j-1}}{2 h}+q\left(x_j\right) v_j=f\left(x_j\right), \quad j=1, \ldots, m,$	$\frac{-v_{j-1}+2 v_j-v_{j+1}}{h^2}+r(x_j) \frac{v_{j+1}-v_{j-1}}{2 h}+q(x_j) v_j=f(x_j), \quad j=1, \ldots, m,$
lyche-numerical-linear-algebra_EQ0162	72	1.000	`b_{j}= \begin{cases}h^{2} f\left(x_{1}\right)-a_{1} g_{0}, & \text { if } j=1, \\ h^{2} f\left(x_{j}\right), & \text { if } 2 \leq j \leq m-1, \\ h^{2} f\left(x_{m} \right)-c_{m} g_{1}, & \text { if } j=m .\end{cases}`	$b_j=\begin{cases}h^2 f\left(x_1\right)-a_1 g_0, & \text { if } j=1, \\ h^2 f\left(x_j\right), & \text { if } 2 \leq j \leq m-1, \\ h^2 f\left(x_m\right)-c_m g_1, & \text { if } j=m .\end{cases}$	$b_j=\begin{cases}h^2 f(x_1)-a_1 g_0, & \text { if } j=1, \\ h^2 f(x_j), & \text { if } 2 \leq j \leq m-1, \\ h^2 f(x_m)-c_m g_1, & \text { if } j=m .\end{cases}$
lyche-numerical-linear-algebra_EQ0163	72	1.000	`F=\frac{4 \sin ^{2}(\pi h / 2) R}{h^{2} L^{2}}=\frac{ \pi^{2} R}{L^{2}}+O\left(h^{2}\right) .`	$F=\frac{4 \sin ^2(\pi h / 2) R}{h^2 L^2}=\frac{\pi^2 R}{L^2}+O\left(h^2\right) .$	$F=\frac{4 \sin ^2(\pi h / 2) R}{h^2 L^2}=\frac{\pi^2 R}{L^2}+O(h^2).$
lyche-numerical-linear-algebra_EQ0165 (2.39)	73	1.000	`s_{i, j}=s_{j, i}=\frac{1}{m+1} j(m+1-i), \quad 1 \leq j \leq i \leq m .`	$s_{i, j}=s_{j, i}=\frac{1}{m+1} j(m+1-i), \quad 1 \leq j \leq i \leq m .$	$s_{i, j}=s_{j, i}=\frac{1}{m+1} j\left(m+1-i\right), \quad 1 \leq j \leq i \leq m.$
lyche-numerical-linear-algebra_EQ0167	73	1.000	`\boldsymbol{A} \boldsymbol{X}=\boldsymbol{B} \quad \Longleftrightarrow \quad \boldsymbol{A} \boldsymbol{x}_{: j}=\boldsymbol{b}_{: j}, j=1, \ldots, p .`	$\boldsymbol{A} \boldsymbol{X}=\boldsymbol{B} \quad \Longleftrightarrow \quad \boldsymbol{A} \boldsymbol{x}_{: j}=\boldsymbol{b}_{: j}, j=1, \ldots, p .$	$\boldsymbol{A} \boldsymbol{X}=\boldsymbol{B} \quad \Longleftrightarrow \quad \boldsymbol{A} \boldsymbol{x}_{: j}=\boldsymbol{b}_{: j}, \ j=1, \ldots, p.$

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lyche-numerical-linear-algebra_EQ0173	76	1.000	`\begin{aligned} & x_{3}=b_{3}^{(3)} / a_{33}^{(3)} \\ & x_{2}=\left(b_{2}^{(2)}-a_{23}^{(2)} x_{3}\right) / a_{22}^{(2)} \\ & x_{1}=\left(b_{1}^{(1)}-a_{12}^{(1)} x_{2}-a_{13}^{(1)} x_{3}\right) / a_{11}^{(1)} . \end{aligned}`	$\begin{aligned} & x_{3}=b_{3}^{(3)} / a_{33}^{(3)} \\ & x_{2}=\left(b_{2}^{(2)}-a_{23}^{(2)} x_{3}\right) / a_{22}^{(2)} \\ & x_{1}=\left(b_{1}^{(1)}-a_{12}^{(1)} x_{2}-a_{13}^{(1)} x_{3}\right) / a_{11}^{(1)} . \end{aligned}$	$\begin{aligned} & x_{3}=b_{3}^{(3)} / a_{33}^{(3)} \\ & x_{2}=(b_{2}^{(2)}-a_{23}^{(2)} x_{3}) / a_{22}^{(2)} \\ & x_{1}=(b_{1}^{(1)}-a_{12}^{(1)} x_{2}-a_{13}^{(1)} x_{3}) / a_{11}^{(1)} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0177 (3.2)	77	1.000	`\text { for } j=k: n`	$\text{ for } j=k: n$	$\text{ for } j=k: n$
lyche-numerical-linear-algebra_EQ0178	77	1.000	`a_{i j}^{(k+1)}=a_{i j}^{(k)}-l_{i k}^{(k)} a_{k j}^{(k)}`	$a_{i j}^{(k+1)}=a_{i j}^{(k)}-l_{i k}^{(k)} a_{k j}^{(k)}$	$a_{i j}^{(k+1)}=a_{i j}^{(k)}-l_{i k}^{(k)} a_{k j}^{(k)}$
lyche-numerical-linear-algebra_EQ0179	78	1.000	`\boldsymbol{A}_{[k]}:=\boldsymbol{A}(1: k, 1: k)=\left[ \begin{array}{ccc} a_{11} & \cdots & a_{k 1} \\ \vdots & & \vdots \\ a_{k 1} & \cdots & a_{k k} \end{array}\right]`	$\boldsymbol{A}_{[k]}:=\boldsymbol{A}(1: k, 1: k)=\left[\begin{array}{ccc} a_{11} & \cdots & a_{k 1} \\ \vdots & & \vdots \\ a_{k 1} & \cdots & a_{k k} \end{array}\right]$	$\boldsymbol{A}_{[k]}:=\boldsymbol{A}(1: k, 1: k)=\left[\begin{array}{ccc} a_{11} & \cdots & a_{k 1} \\ \vdots & & \vdots \\ a_{k 1} & \cdots & a_{k k} \end{array}\right]$
lyche-numerical-linear-algebra_EQ0180	78	1.000	`b_{i, j}=a_{r_{i}, r_{j}}, \quad i, j=1, \ldots, k .`	$b_{i, j}=a_{r_{i}, r_{j}}, \quad i, j=1, \ldots, k .$	$b_{i, j}=a_{r_{i}, r_{j}}, \quad i, j=1, \ldots, k .$
lyche-numerical-linear-algebra_EQ0182	78	1.000	`[1],\left[\begin{array}{ll} 1 & 2 \\ 4 & 5 \end{array} \right], \boldsymbol{A} .`	$[1],\left[\begin{array}{ll} 1 & 2 \\ 4 & 5 \end{array} \right], \boldsymbol{A} .$	$[1],\left[\begin{array}{ll} 1 & 2 \\ 4 & 5 \end{array} \right], \boldsymbol{A} .$
lyche-numerical-linear-algebra_EQ0183 (3.3)	78	1.000	`\operatorname{det}\left(\boldsymbol{A}_{[k]} \right)=a_{11}^{(1)} a_{22}^{(2)} \cdots a_{k k}^{(k)}, \quad k=1, \ldots, n .`	$\operatorname{det}\left(\boldsymbol{A}_{[k]}\right)=a_{11}^{(1)} a_{22}^{(2)} \cdots a_{k k}^{(k)}, \quad k=1, \ldots, n .$	$\operatorname{det}\left(\boldsymbol{A}_{[k]}\right)=a_{11}^{(1)} a_{22}^{(2)} \cdots a_{k k}^{(k)}, \quad k=1, \ldots, n .$
lyche-numerical-linear-algebra_EQ0187 (3.6)	79	1.000	`(\boldsymbol{L} \boldsymbol{U})_{i j}=\sum_{k=1}^{j-1} l_{i k}^{(k)} a_{k j}^{(k)}+l_{i j} a_{j j}^{(j)}= \sum_{k=1}^{j-1}\left(a_{i j}^{(k)}-a_{i j}^{(k+1)} \right)+a_{i j}^{(j)}=a_{i j} .`	$(\boldsymbol{L} \boldsymbol{U})_{i j}=\sum_{k=1}^{j-1} l_{i k}^{(k)} a_{k j}^{(k)}+l_{i j} a_{j j}^{(j)}=\sum_{k=1}^{j-1}\left(a_{i j}^{(k)}-a_{i j}^{(k+1)}\right)+a_{i j}^{(j)}=a_{i j} .$	$(\boldsymbol{L} \boldsymbol{U})_{i j}=\sum_{k=1}^{j-1} l_{i k}^{(k)} a_{k j}^{(k)}+l_{i j} a_{j j}^{(j)}=\sum_{k=1}^{j-1}\left(a_{i j}^{(k)}-a_{i j}^{(k+1)}\right)+a_{i j}^{(j)}=a_{i j} .$
lyche-numerical-linear-algebra_EQ0188	80	1.000	`\left[\begin{array}{ccc} a_{11} & 0 & 0 \\ a_{21} & a_{22} & 0 \\ a_{31} & a_{32} & a_{33} \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \\ x_{3} \end{array}\right]=\left[\begin{array}{l} b_{1} \\ b_{2} \\ b_{3} \end{array}\right] .`	$\left[\begin{array}{ccc} a_{11} & 0 & 0 \\ a_{21} & a_{22} & 0 \\ a_{31} & a_{32} & a_{33} \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \\ x_{3} \end{array}\right]=\left[\begin{array}{l} b_{1} \\ b_{2} \\ b_{3} \end{array}\right] .$	$\left[\begin{array}{ccc} a_{11} & 0 & 0 \\ a_{21} & a_{22} & 0 \\ a_{31} & a_{32} & a_{33} \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \\ x_{3} \end{array}\right]=\left[\begin{array}{l} b_{1} \\ b_{2} \\ b_{3} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0191	80	1.000	`\left[\begin{array}{ccccc} a_{11} & 0 & 0 & 0 & 0 \ \ a_{21} & a_{22} & 0 & 0 & 0 \\ 0 & a_{32} & a_{33} & 0 & 0 \\ 0 & 0 & a_{43} & a_{44} & 0 \\ 0 & 0 & 0 & a_{54} & a_{55} \end{array}\right], \quad\left[\begin{array}{ccccc} a_{11} & 0 & 0 & 0 & 0 \\ a_{21} & a_{22} & 0 & 0 & 0 \\ a_{31} & a_{32} & a_{33} & 0 & 0 \\ 0 & a_{42} & a_{43} & a_{44} & 0 \\ 0 & 0 & a_{53} & a_{54} & a_{55} \end{array}\right]`	$\left[\begin{array}{ccccc} a_{11} & 0 & 0 & 0 & 0 \ \ a_{21} & a_{22} & 0 & 0 & 0 \\ 0 & a_{32} & a_{33} & 0 & 0 \\ 0 & 0 & a_{43} & a_{44} & 0 \\ 0 & 0 & 0 & a_{54} & a_{55} \end{array}\right], \quad\left[\begin{array}{ccccc} a_{11} & 0 & 0 & 0 & 0 \\ a_{21} & a_{22} & 0 & 0 & 0 \\ a_{31} & a_{32} & a_{33} & 0 & 0 \\ 0 & a_{42} & a_{43} & a_{44} & 0 \\ 0 & 0 & a_{53} & a_{54} & a_{55} \end{array}\right]$	$\left[\begin{array}{ccccc} a_{11} & 0 & 0 & 0 & 0 \ \ a_{21} & a_{22} & 0 & 0 & 0 \\ 0 & a_{32} & a_{33} & 0 & 0 \\ 0 & 0 & a_{43} & a_{44} & 0 \\ 0 & 0 & 0 & a_{54} & a_{55} \end{array}\right], \quad\left[\begin{array}{ccccc} a_{11} & 0 & 0 & 0 & 0 \\ a_{21} & a_{22} & 0 & 0 & 0 \\ a_{31} & a_{32} & a_{33} & 0 & 0 \\ 0 & a_{42} & a_{43} & a_{44} & 0 \\ 0 & 0 & a_{53} & a_{54} & a_{55} \end{array}\right]$

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lyche-numerical-linear-algebra_EQ0192	81	■ 1.000	`\left[\begin{array}{cccc} a_{k, k} & 0 & \cdots & 0 \\ a_{k+1, k} & a_{k+1, k+1} & \cdots & 0 \\ \vdots & & & \vdots \\ a_{n, k} & & \cdots & a_{n \times n} \end{array}\right]\left[\begin{array}{c} x_{k} \\ x_{k+1} \\ \vdots \\ x_{n} \end{array}\right]=\left[\begin{array}{c} b_{k} \\ b_{k+1} \\ \vdots \\ b_{n} \end{array}\right] .`	$\left[\begin{array}{cccc} a_{k,k} & 0 & \cdots & 0 \\ a_{k+1,k} & a_{k+1,k+1} & \cdots & 0 \\ \vdots & & & \vdots \\ a_{n,k} & & \cdots & a_{n\times n} \end{array}\right]\left[\begin{array}{c} x_{k} \\ x_{k+1} \\ \vdots \\ x_{n} \end{array}\right]=\left[\begin{array}{c} b_{k} \\ b_{k+1} \\ \vdots \\ b_{n} \end{array}\right] .$	$\left[\begin{array}{cccc} a_{k,k} & 0 & \cdots & 0 \\ a_{k+1,k} & a_{k+1,k+1} & \cdots & 0 \\ \vdots & & & \vdots \\ a_{n,k} & & \cdots & a_{n\times n} \end{array}\right]\left[\begin{array}{c} x_{k} \\ x_{k+1} \\ \vdots \\ x_{n} \end{array}\right]=\left[\begin{array}{c} b_{k} \\ b_{k+1} \\ \vdots \\ b_{n} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0194	82	■ 1.000	`b((k+1): n)=b((k+1): n)-x(k) * A((k+1): n, k) .`	$b((k+1):n)=b((k+1):n)-x(k)*A((k+1):n,k).$	$b((k+1):n)=b((k+1):n)-x(k)*A((k+1):n,k).$
lyche-numerical-linear-algebra_EQ0195 (3.9)	82	■ 1.000	`\begin{figure} \captionsetup{labelformat=empty} \caption{Listing 3.3 cforwardsolve} \[ N_{L U}:= \frac{2}{3} n^{3}-\frac{1}{2} n^{2}-\frac{1}{6} n \] \end{figure}`	*(not rendered)*	$N_{LU}:=\frac{2}{3} n^{3}-\frac{1}{2} n^{2}-\frac{1}{6} n$
lyche-numerical-linear-algebra_EQ0196	83	■ 1.000	`M+D+A+S=\frac{2}{3} n(n-1)\left(n-\frac{1}{2}\right)+ \frac{1}{2} n(n-1)=N_{L U}`	$M+D+A+S=\frac{2}{3} n(n-1)\left(n-\frac{1}{2}\right)+\frac{1}{2} n(n-1)=N_{LU}$	$M+D+A+S=\frac{2}{3} n(n-1)(n-\frac{1}{2})+\frac{1}{2} n(n-1)=N_{LU}$
lyche-numerical-linear-algebra_EQ0197	83	■ 1.000	`M+S=2 \sum_{k=1}^{n-1}(n-k)^{2} \approx 2 \int_{1}^{n-1}(n-k)^{2} d k \approx 2 \int_{0}^{n}(n-k)^{2} d k=\frac{2}{3} n^{3}`	$M+S=2 \sum_{k=1}^{n-1}(n-k)^{2} \approx 2 \int_{1}^{n-1}(n-k)^{2} d k \approx 2 \int_{0}^{n}(n-k)^{2} d k=\frac{2}{3} n^{3}$	$M+S=2 \sum_{k=1}^{n-1}(n-k)^{2} \approx 2 \int_{1}^{n-1}(n-k)^{2} d k \approx 2 \int_{0}^{n}(n-k)^{2} d k=\frac{2}{3} n^{3}$
lyche-numerical-linear-algebra_EQ0198	83	■ 1.000	`N_{S}=2 \sum_{k=1}^{n}(2 k-1) \approx 2 \int_{1}^{n}(2 k-1) d k \approx 4 \int_{0}^{n} k d k=2 n^{2}`	$N_{S}=2 \sum_{k=1}^{n}(2 k-1) \approx 2 \int_{1}^{n}(2 k-1) d k \approx 4 \int_{0}^{n} k d k=2 n^{2}$	$N_{S}=2 \sum_{k=1}^{n}(2 k-1) \approx 2 \int_{1}^{n}(2 k-1) d k \approx 4 \int_{0}^{n} k d k=2 n^{2}.$
lyche-numerical-linear-algebra_EQ0199	84	■ 1.000	`\boldsymbol{P}=\boldsymbol{I}(:, \boldsymbol{p})=\left[ \boldsymbol{e}_{i_{1}}, \boldsymbol{e}_{i_{2}}, \ldots, \boldsymbol{e}_{i_{n}}\right] \in \mathbb{R}^{n \times n},`	$\boldsymbol{P}=\boldsymbol{I}(:, \boldsymbol{p})=\left[\boldsymbol{e}_{i_{1}}, \boldsymbol{e}_{i_{2}}, \ldots, \boldsymbol{e}_{i_{n}}\right] \in \mathbb{R}^{n \times n},$	$\boldsymbol{P}=\boldsymbol{I}(:, \boldsymbol{p})=\left[\boldsymbol{e}_{i_{1}}, \boldsymbol{e}_{i_{2}}, \ldots, \boldsymbol{e}_{i_{n}}\right] \in \mathbb{R}^{n \times n},$
lyche-numerical-linear-algebra_EQ0200 (3.10)	84	■ 1.000	`\boldsymbol{A} \boldsymbol{P}=\boldsymbol{A}(:, \boldsymbol{p}), \quad \boldsymbol{P}^{T} \boldsymbol{A}= \boldsymbol{A}(\boldsymbol{p},:) .`	$\boldsymbol{A} \boldsymbol{P}=\boldsymbol{A}(:, \boldsymbol{p}), \quad \boldsymbol{P}^{T} \boldsymbol{A}= \boldsymbol{A}(\boldsymbol{p},:) .$	$\boldsymbol{A} \boldsymbol{P}=\boldsymbol{A}(:, \boldsymbol{p}), \quad \boldsymbol{P}^{T} \boldsymbol{A}= \boldsymbol{A}(\boldsymbol{p},:) .$
lyche-numerical-linear-algebra_EQ0206	86	■ 1.000	`a_{p_{i}, k}^{(k)} a_{p_{k}, j}^{(k)}=a_{p_{i}, j}^{(k)}-a_{p_{i}, j}^{(k+1)} \text { for } k<\min (i, j), \text { and } a_{p_{i}, j}^{(k)} a_{p_{j}, j}^{(j)}=a_{p_{i}, j}^{(j)} \text { for } i>j .`	$a_{p_{i}, k}^{(k)} a_{p_{k}, j}^{(k)}=a_{p_{i}, j}^{(k)}-a_{p_{i}, j}^{(k+1)} \text { for } k<\min (i, j), \text { and } a_{p_{i}, j}^{(k)} a_{p_{j}, j}^{(j)}=a_{p_{i}, j}^{(j)} \text { for } i>j .$	$a_{p_{i}, k}^{(k)} a_{p_{k}, j}^{(k)}=a_{p_{i}, j}^{(k)}-a_{p_{i}, j}^{(k+1)} \text { for } k<\min (i, j), \text { and } a_{p_{i}, j}^{(k)} a_{p_{j}, j}^{(j)}=a_{p_{i}, j}^{(j)} \text { for } i>j .$
lyche-numerical-linear-algebra_EQ0209	87	■ 1.000	`\left|a_{r_{k}, k}^{(k)}\right|:=\max \left\{\left|a_{i, k}^{(k)}\right|: k \leq i \leq n\right\}`	$\left\|a_{r_{k}, k}^{(k)}\right\|:=\max \left\{\left\|a_{i, k}^{(k)}\right\|: k \leq i \leq n\right\}$	$\left\|a_{r_{k}, k}^{(k)}\right\|:=\max \left\{\left\|a_{i, k}^{(k)}\right\|: k \leq i \leq n\right\}$
lyche-numerical-linear-algebra_EQ0211	87	■ 1.000	`\begin{aligned} 10^{-4} x_{1}+2 x_{2} & =4 \\ \left(1-2 \times 10^{4}\right) x_{2} & =3-4 \times 10^{4} \end{aligned}`	$\begin{aligned} 10^{-4} x_{1}+2 x_{2} & =4 \\ \left(1-2 \times 10^{4}\right) x_{2} & =3-4 \times 10^{4} \end{aligned}$	$\begin{aligned} 10^{-4} x_{1}+2 x_{2} & =4 \\ \left(1-2 \times 10^{4}\right) x_{2} & =3-4 \times 10^{4} \end{aligned}$
lyche-numerical-linear-algebra_EQ0212	87	■ 1.000	`x_{2}=\frac{-39997}{-19999} \approx 2, \quad x_{1}= \frac{4-2 x_{2}}{10^{-4}}=\frac{20000}{19999} \approx 1 .`	$x_{2}=\frac{-39997}{-19999} \approx 2, \quad x_{1}=\frac{4-2 x_{2}}{10^{-4}}=\frac{20000}{19999} \approx 1 .$	$x_{2}=\frac{-39997}{-19999} \approx 2, \quad x_{1}=\frac{4-2 x_{2}}{10^{-4}}=\frac{20000}{19999} \approx 1 .$
lyche-numerical-linear-algebra_EQ0214	87	■ 1.000	`\begin{aligned} x_{1}+x_{2} & =3 \\ 10^{-4} x_{1}+2 x_{2} & =4 \end{aligned}`	$\begin{aligned} x_{1}+x_{2} & =3 \\ 10^{-4} x_{1}+2 x_{2} & =4 \end{aligned}$	$\begin{aligned} x_{1}+x_{2} & =3 \\ 10^{-4} x_{1}+2 x_{2} & =4 \end{aligned}$

Identifier	Page	Conf.	LaTeX source	Rendered	Image
lyche-numerical-linear-algebra_EQ0215	87	1.000	\begin{aligned} x_{1}+x_{2} & =3 \\ \left(2-10^{-4} \right) x_{2} & =4-3 \times 10^{-4} \end{aligned}	$\begin{aligned} x_{1}+x_{2} & =3 \\ \left(2-10^{-4}\right) x_{2} & =4-3 \times 10^{-4} \end{aligned}$	$\begin{aligned} x_{1}+x_{2} & =3 \\ (2-10^{-4})x_{2} & =4-3 \times 10^{-4} \end{aligned}$
lyche-numerical-linear-algebra_EQ0217	88	1.000	\frac{\left|a_{r_{k}, k}^{(k)}\right|}{s_{k}}:=\max \left \{\frac{\left|a_{i, k}^{(k)}\right|}{s_{k}}: k \leq i \leq n\right\}, \quad s_{k}:=\max _{1 \leq j \leq n} \left|a_{k j}\right| .	$\frac{\left\|a_{r_{k}, k}^{(k)}\right\|}{s_{k}}:=\max \left\{\frac{\left\|a_{i, k}^{(k)}\right\|}{s_{k}}: k \leq i \leq n\right\}, \quad s_{k}:=\max _{1 \leq j \leq n} \left\|a_{k j}\right\| .$	$\frac{\left\|a_{r_{k}, k}^{(k)}\right\|}{s_{k}}:=\max \left\{\frac{\left\|a_{i, k}^{(k)}\right\|}{s_{k}}: k \leq i \leq n\right\}, \quad s_{k}:=\max _{1 \leq j \leq n} \left\|a_{k j}\right\| .$
lyche-numerical-linear-algebra_EQ0218	88	1.000	a_{r_{k}, s_{k}}^{(k)}:=\max \left\{\left|a_{i, j}^{(k)} \right|: k \leq i, j \leq n\right\}	$a_{r_{k}, s_{k}}^{(k)}:=\max \left\{\left\|a_{i, j}^{(k)}\right\|: k \leq i, j \leq n\right\}$	$a_{r_{k}, s_{k}}^{(k)}:=\max \{\left\|a_{i, j}^{(k)}\right\|: k \leq i, j \leq n\}$
lyche-numerical-linear-algebra_EQ0219	88	1.000	\boldsymbol{L}=\left[\begin{array}{ccc} l_{1,1} & \cdots & 0 \\ \vdots & \ddots & \vdots \\ l_{n, 1} & \cdots & l_{n, n} \end{array}\right], \quad \boldsymbol{U}=\left[\begin{array}{ccc} u_{1,1} & \cdots & u_{1, n} \\ \vdots & \ddots & \vdots \\ 0 & \cdots & u_{n, n} \end{array} \right] .	$\boldsymbol{L}=\left[\begin{array}{ccc} l_{1,1} & \cdots & 0 \\ \vdots & \ddots & \vdots \\ l_{n, 1} & \cdots & l_{n, n} \end{array}\right], \quad \boldsymbol{U}=\left[\begin{array}{ccc} u_{1,1} & \cdots & u_{1, n} \\ \vdots & \ddots & \vdots \\ 0 & \cdots & u_{n, n} \end{array} \right] .$	$\boldsymbol{L}=\left[\begin{array}{ccc} l_{1,1} & \cdots & 0 \\ \vdots & \ddots & \vdots \\ l_{n, 1} & \cdots & l_{n, n} \end{array}\right], \quad \boldsymbol{U}=\left[\begin{array}{ccc} u_{1,1} & \cdots & u_{1, n} \\ \vdots & \ddots & \vdots \\ 0 & \cdots & u_{n, n} \end{array} \right] .$
lyche-numerical-linear-algebra_EQ0221 (3.15)	89	1.000	u_{1}=a, \quad u_{2}=b, \quad a l_{1}=c, \quad b l_{1}+u_{3}=d .	$u_{1}=a, \quad u_{2}=b, \quad a l_{1}=c, \quad b l_{1}+u_{3}=d .$	$u_{1}=a, \quad u_{2}=b, \quad a l_{1}=c, \quad b l_{1}+u_{3}=d .$
lyche-numerical-linear-algebra_EQ0222	89	1.000	\boldsymbol{A}_{1}:=\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right], \quad \boldsymbol{A}_{2}:=\left[\begin{array}{ll} 0 & 1 \\ 1 & 1 \end{array}\right], \quad \boldsymbol{A}_{3}:=\left[\begin{array}{ll} 0 & 1 \\ 0 & 2 \end{array}\right], \quad \boldsymbol{A}_{4}:= \left[\begin{array}{ll} 1 & 1 \\ 1 & 1 \end{array}\right] .	$\boldsymbol{A}_{1}:=\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right], \quad \boldsymbol{A}_{2}:=\left[\begin{array}{ll} 0 & 1 \\ 1 & 1 \end{array}\right], \quad \boldsymbol{A}_{3}:=\left[\begin{array}{ll} 0 & 1 \\ 0 & 2 \end{array}\right], \quad \boldsymbol{A}_{4}:= \left[\begin{array}{ll} 1 & 1 \\ 1 & 1 \end{array}\right] .$	$\boldsymbol{A}_{1}:=\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right], \quad \boldsymbol{A}_{2}:=\left[\begin{array}{ll} 0 & 1 \\ 1 & 1 \end{array}\right], \quad \boldsymbol{A}_{3}:=\left[\begin{array}{ll} 0 & 1 \\ 0 & 2 \end{array}\right], \quad \boldsymbol{A}_{4}:= \left[\begin{array}{ll} 1 & 1 \\ 1 & 1 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0223	89	1.000	\boldsymbol{A}_{[k]}:=\left[\begin{array}{ccc} a_{11} & \cdots & a_{k 1} \\ \vdots & & \vdots \\ a_{k 1} & \cdots & a_{k k} \end{array}\right]	$\boldsymbol{A}_{[k]}:=\left[\begin{array}{ccc} a_{11} & \cdots & a_{k 1} \\ \vdots & & \vdots \\ a_{k 1} & \cdots & a_{k k} \end{array}\right]$	$\boldsymbol{A}_{[k]}:=\left[\begin{array}{ccc} a_{11} & \cdots & a_{k 1} \\ \vdots & & \vdots \\ a_{k 1} & \cdots & a_{k k} \end{array}\right]$
lyche-numerical-linear-algebra_EQ0225 (3.17)	90	1.000	\boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{[n-1]} & \boldsymbol{c}_{n} \\ \boldsymbol{r}_{n}^{T} & a_{n n} \end{array}\right]= \left[\begin{array}{cc} \boldsymbol{L}_{n-1} & \mathbf{0} \\ \boldsymbol{l}_{n}^{T} & 1 \end{array} \right]\left[\begin{array}{cc} \boldsymbol{U}_{n-1} & \boldsymbol{u}_{n} \\ 0 & u_{n n} \end{array} \right]=\left[\begin{array}{cc} \boldsymbol{L}_{n-1} \boldsymbol{U}_{n-1} & \boldsymbol{L}_{n-1} \boldsymbol{u}_{n} \\ \boldsymbol{l}_{n}^{T} \boldsymbol{U}_{n-1} & \boldsymbol{l}_{n}^{T} \boldsymbol{u}_{n}+u_{n n} \end{array}\right],	$\boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{[n-1]} & \boldsymbol{c}_{n} \\ \boldsymbol{r}_{n}^{T} & a_{n n} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{L}_{n-1} & \mathbf{0} \\ \boldsymbol{l}_{n}^{T} & 1 \end{array} \right]\left[\begin{array}{cc} \boldsymbol{U}_{n-1} & \boldsymbol{u}_{n} \\ 0 & u_{n n} \end{array} \right]=\left[\begin{array}{cc} \boldsymbol{L}_{n-1} \boldsymbol{U}_{n-1} & \boldsymbol{L}_{n-1} \boldsymbol{u}_{n} \\ \boldsymbol{l}_{n}^{T} \boldsymbol{U}_{n-1} & \boldsymbol{l}_{n}^{T} \boldsymbol{u}_{n}+u_{n n} \end{array}\right],$	$\boldsymbol{A}=\left[\begin{array}{cc} \boldsymbol{A}_{[n-1]} & \boldsymbol{c}_{n} \\ \boldsymbol{r}_{n}^{T} & a_{n n} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{L}_{n-1} & \mathbf{0} \\ \boldsymbol{l}_{n}^{T} & 1 \end{array} \right]\left[\begin{array}{cc} \boldsymbol{U}_{n-1} & \boldsymbol{u}_{n} \\ 0 & u_{n n} \end{array} \right]=\left[\begin{array}{cc} \boldsymbol{L}_{n-1} \boldsymbol{U}_{n-1} & \boldsymbol{L}_{n-1} \boldsymbol{u}_{n} \\ \boldsymbol{l}_{n}^{T} \boldsymbol{U}_{n-1} & \boldsymbol{l}_{n}^{T} \boldsymbol{u}_{n}+u_{n n} \end{array}\right],$
lyche-numerical-linear-algebra_EQ0226 (3.18)	90	1.000	\boldsymbol{U}_{n-1}^{T} \boldsymbol{l}_{n}= \boldsymbol{r}_{n}, \quad \boldsymbol{L}_{n-1} \boldsymbol{L}_{n-1} \boldsymbol{u}_{n}=\boldsymbol{c}_{n}, \quad u_{n n}=a_{n n}-\boldsymbol{l}_{n}^{T} \boldsymbol{u}_{n} .	$\boldsymbol{U}_{n-1}^{T} \boldsymbol{l}_{n}= \boldsymbol{r}_{n}, \quad \boldsymbol{L}_{n-1} \boldsymbol{L}_{n-1} \boldsymbol{u}_{n}=\boldsymbol{c}_{n}, \quad u_{n n}=a_{n n}-\boldsymbol{l}_{n}^{T} \boldsymbol{u}_{n} .$	$\boldsymbol{U}_{n-1}^{T} \boldsymbol{l}_{n}= \boldsymbol{r}_{n}, \quad \boldsymbol{L}_{n-1} \boldsymbol{L}_{n-1} \boldsymbol{u}_{n}=\boldsymbol{c}_{n}, \quad u_{n n}=a_{n n}-\boldsymbol{l}_{n}^{T} \boldsymbol{u}_{n} .$

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lyche-numerical-linear-algebra_EQ0227	91	■ 1.000	\boldsymbol{U}_{k-1}^{T} \boldsymbol{l}_{k}= \boldsymbol{r}_{k}, \quad\left[\begin{array}{cc} \boldsymbol{L}_{k-1} & \mathbf{0} \\ \boldsymbol{l}_{k}^{T} & 1 \end{array}\right] \left[\begin{array}{c} \boldsymbol{u}_{k} \\ u_{k k} \end{array}\right]=\left[\begin{array}{c} \boldsymbol{c}_{k} \\ a_{k k} \end{array}\right] .	$\boldsymbol{U}_{k-1}^{T} \boldsymbol{l}_{k}= \boldsymbol{r}_{k}, \quad\left[\begin{array}{cc} \boldsymbol{L}_{k-1} & \mathbf{0} \\ \boldsymbol{l}_{k}^{T} & 1 \end{array}\right] \left[\begin{array}{c} \boldsymbol{u}_{k} \\ u_{k k} \end{array}\right]=\left[\begin{array}{c} \boldsymbol{c}_{k} \\ a_{k k} \end{array}\right] .$	$\boldsymbol{U}_{k-1}^{T} \boldsymbol{l}_{k}= \boldsymbol{r}_{k}, \quad\left[\begin{array}{cc} \boldsymbol{L}_{k-1} & \mathbf{0} \\ \boldsymbol{l}_{k}^{T} & 1 \end{array}\right] \left[\begin{array}{c} \boldsymbol{u}_{k} \\ u_{k k} \end{array}\right]=\left[\begin{array}{c} \boldsymbol{c}_{k} \\ a_{k k} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0230	92	■ 1.000	\boldsymbol{A}_{\{k\}}:=\left[\begin{array}{ccc} \boldsymbol{A}_{11} & \cdots & \boldsymbol{A}_{1 k} \\ \vdots & & \vdots \\ \boldsymbol{A}_{k 1} & \cdots & \boldsymbol{A}_{k k} \end{array}\right]	$\boldsymbol{A}_{\{k\}}:=\left[\begin{array}{ccc} \boldsymbol{A}_{11} & \cdots & \boldsymbol{A}_{1 k} \\ \vdots & & \vdots \\ \boldsymbol{A}_{k 1} & \cdots & \boldsymbol{A}_{k k} \end{array}\right]$	$\boldsymbol{A}_{\{k\}}:=\left[\begin{array}{ccc} \boldsymbol{A}_{11} & \cdots & \boldsymbol{A}_{1 k} \\ \vdots & & \vdots \\ \boldsymbol{A}_{k 1} & \cdots & \boldsymbol{A}_{k k} \end{array}\right]$
lyche-numerical-linear-algebra_EQ0232 (3.22)	93	■ 1.000	\begin{figure} \captionsetup{labelformat=empty} \caption{Listing 3.5 cbacksolve} \[\boldsymbol{A}((k+1): n,(k+1): n) \boldsymbol{b}_{k}((k+1): n)=- \boldsymbol{A}((k+1): n, k) b_{k}(k), \quad k=1, \ldots, n-1 . \] \end{figure}	*(not rendered)*	$\boldsymbol{A}((k+1): n,(k+1): n) \boldsymbol{b}_{k}((k+1): n)=-\boldsymbol{A}((k+1): n, k) b_{k}(k), \quad k=1, \ldots, n-1 .$
lyche-numerical-linear-algebra_EQ0233 (3.23)	94	■ 1.000	\boldsymbol{A}(1: k, 1: k) \boldsymbol{b}_{k}(1: k)= \boldsymbol{I}(1: k, k), \quad k=n, n-1, \ldots, 1,	$\boldsymbol{A}(1: k, 1: k) \boldsymbol{b}_{k}(1: k)= \boldsymbol{I}(1: k, k), \quad k=n, n-1, \ldots, 1,$	$\boldsymbol{A}(1: k, 1: k) \boldsymbol{b}_{k}(1: k)= \boldsymbol{I}(1: k, k), \quad k=n, n-1, \ldots, 1,$
lyche-numerical-linear-algebra_EQ0235 (3.28)	95	■ 1.000	\boldsymbol{C}:=\boldsymbol{U}+\boldsymbol{v} \boldsymbol{e}_{1}^{T},	$\boldsymbol{C}:=\boldsymbol{U}+\boldsymbol{v} \boldsymbol{e}_{1}^{T},$	$\boldsymbol{C}:=\boldsymbol{U}+\boldsymbol{v} \boldsymbol{e}_{1}^{T},$
lyche-numerical-linear-algebra_EQ0236 (3.29)	95	■ 1.000	\boldsymbol{P}:=\boldsymbol{I}_{1,2} \boldsymbol{I}_{2,3} \cdots \boldsymbol{I}_{n-1, n},	$\boldsymbol{P}:=\boldsymbol{I}_{1,2} \boldsymbol{I}_{2,3} \cdots \boldsymbol{I}_{n-1, n},$	$\boldsymbol{P}:=\boldsymbol{I}_{1,2} \boldsymbol{I}_{2,3} \cdots \boldsymbol{I}_{n-1, n},$
lyche-numerical-linear-algebra_EQ0237 (3.30)	96	■ 1.000	\boldsymbol{B}:=\boldsymbol{A}+\boldsymbol{w} \boldsymbol{e}_{1}^{T} .	$\boldsymbol{B}:=\boldsymbol{A}+\boldsymbol{w} \boldsymbol{e}_{1}^{T} .$	$\boldsymbol{B}:=\boldsymbol{A}+\boldsymbol{w} \boldsymbol{e}_{1}^{T} .$
lyche-numerical-linear-algebra_EQ0238	96	■ 1.000	\operatorname{det}\left(\boldsymbol{A}_{[k]} \right)=u_{11} u_{22} \cdots u_{k k} \text { for } k=1, \ldots, n .	$\operatorname{det}\left(\boldsymbol{A}_{[k]} \right)=u_{11} u_{22} \cdots u_{k k} \text { for } k=1, \ldots, n .$	$\operatorname{det}\left(\boldsymbol{A}_{[k]} \right)=u_{11} u_{22} \cdots u_{k k} \text { for } k=1, \ldots, n .$
lyche-numerical-linear-algebra_EQ0239 (3.31)	97	■ 1.000	u_{11}=a_{11}, \quad u_{k k}=\frac{\operatorname{det} \left(\boldsymbol{A}_{[k]}\right)}{\operatorname{det} \left(\boldsymbol{A}_{[k-1]}\right)}, \text { for } k=2, \ldots, n .	$u_{11}=a_{11}, \quad u_{k k}=\frac{\operatorname{det} \left(\boldsymbol{A}_{[k]}\right)}{\operatorname{det} \left(\boldsymbol{A}_{[k-1]}\right)}, \text { for } k=2, \ldots, n .$	$u_{11}=a_{11}, \quad u_{k k}=\frac{\operatorname{det} \left(\boldsymbol{A}_{[k]}\right)}{\operatorname{det} \left(\boldsymbol{A}_{[k-1]}\right)}, \text { for } k=2, \ldots, n .$
lyche-numerical-linear-algebra_EQ0242	98	■ 1.000	\boldsymbol{B}:=\left[\boldsymbol{a}_{1}, \ldots, \boldsymbol{a}_{p-1}, \boldsymbol{a}_{p+1}, \ldots, \boldsymbol{a}_{n}, \boldsymbol{b}\right] \in \mathbb{R}^{n \times n} .	$\boldsymbol{B}:=\left[\boldsymbol{a}_{1}, \ldots, \boldsymbol{a}_{p-1}, \boldsymbol{a}_{p+1}, \ldots, \boldsymbol{a}_{n}, \boldsymbol{b}\right] \in \mathbb{R}^{n \times n} .$	$\boldsymbol{B}:=\left[\boldsymbol{a}_{1}, \ldots, \boldsymbol{a}_{p-1}, \boldsymbol{a}_{p+1}, \ldots, \boldsymbol{a}_{n}, \boldsymbol{b}\right] \in \mathbb{R}^{n \times n} .$
lyche-numerical-linear-algebra_EQ0243	98	■ 1.000	A:=\left[\begin{array}{rr} -3 & -2 \\ 4 & 2 \end{array} \right] .	$A:=\left[\begin{array}{rr} -3 & -2 \\ 4 & 2 \end{array} \right] .$	$A:=\left[\begin{array}{rr} -3 & -2 \\ 4 & 2 \end{array} \right] .$
lyche-numerical-linear-algebra_EQ0244	98	■ 1.000	\boldsymbol{P}:=\left[\boldsymbol{e}_{n}, \boldsymbol{e}_{n-1}, \ldots, \boldsymbol{e}_{1}\right] .	$\boldsymbol{P}:=\left[\boldsymbol{e}_{n}, \boldsymbol{e}_{n-1}, \ldots, \boldsymbol{e}_{1}\right] .$	$\boldsymbol{P}:=\left[\boldsymbol{e}_{n}, \boldsymbol{e}_{n-1}, \ldots, \boldsymbol{e}_{1}\right] .$
lyche-numerical-linear-algebra_EQ0246 (4.1)	101	■ 1.000	d_{1}=a . \quad a l_{1}=b, \quad d_{2}=d-a\left|l_{1} \right|^{2} .	$d_{1}=a . \quad a l_{1}=b, \quad d_{2}=d-a\left\|l_{1} \right\|^{2} .$	$d_{1}=a . \quad a l_{1}=b, \quad d_{2}=d-a\left\|l_{1} \right\|^{2} .$
lyche-numerical-linear-algebra_EQ0251	102	■ 1.000	f(\boldsymbol{x})=\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}=\sum_{i=1}^{n} \sum_{j=1}^{n} a_{i j} \bar{x}_{i} x_{j}	$f(\boldsymbol{x})=\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}=\sum_{i=1}^{n} \sum_{j=1}^{n} a_{i j} \bar{x}_{i} x_{j}$	$f(\boldsymbol{x})=\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x}=\sum_{i=1}^{n} \sum_{j=1}^{n} a_{i j} \bar{x}_{i} x_{j}$

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lyche-numerical-linear-algebra_EQ0255 (4.5)	104	1.000	\boldsymbol{A}(\boldsymbol{r}, \boldsymbol{r})= \boldsymbol{X}^{*} \boldsymbol{A} \boldsymbol{X}, \quad \boldsymbol{X}:=\left[\boldsymbol{e}_{r_{1}}, \ldots, \boldsymbol{e}_{r_{k}}\right] \in \mathbb{C}^{n \times k} .	$\boldsymbol{A}(\boldsymbol{r}, \boldsymbol{r})=\boldsymbol{X}^{*} \boldsymbol{A} \boldsymbol{X}, \quad \boldsymbol{X}:=\left[\boldsymbol{e}_{r_{1}}, \ldots, \boldsymbol{e}_{r_{k}}\right] \in \mathbb{C}^{n \times k} .$	$\boldsymbol{A}(\boldsymbol{r}, \boldsymbol{r})=\boldsymbol{X}^{*} \boldsymbol{A} \boldsymbol{X}, \quad \boldsymbol{X}:=\left[\boldsymbol{e}_{r_{1}}, \ldots, \boldsymbol{e}_{r_{k}}\right] \in \mathbb{C}^{n \times k} .$
lyche-numerical-linear-algebra_EQ0256 (4.6)	104	1.000	\boldsymbol{y}^{*} \boldsymbol{B} \boldsymbol{y}= \boldsymbol{y}^{*} \boldsymbol{X}^{*} \boldsymbol{A} \boldsymbol{X} \boldsymbol{y}=\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x} \geq 0, \quad \boldsymbol{y} \in \mathbb{C}^{k}, \quad \boldsymbol{x}:= \boldsymbol{X} \boldsymbol{y} .	$\boldsymbol{y}^{*} \boldsymbol{B} \boldsymbol{y}=\boldsymbol{y}^{*} \boldsymbol{X}^{*} \boldsymbol{A} \boldsymbol{X} \boldsymbol{y}=\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x} \geq 0, \quad \boldsymbol{y} \in \mathbb{C}^{k}, \quad \boldsymbol{x}:= \boldsymbol{X} \boldsymbol{y} .$	$\boldsymbol{y}^{*} \boldsymbol{B} \boldsymbol{y}=\boldsymbol{y}^{*} \boldsymbol{X}^{*} \boldsymbol{A} \boldsymbol{X} \boldsymbol{y}=\boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x} \geq 0, \quad \boldsymbol{y} \in \mathbb{C}^{k}, \quad \boldsymbol{x}:= \boldsymbol{X} \boldsymbol{y} .$
lyche-numerical-linear-algebra_EQ0257 (0)	105	1.000	\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array} \right]=\left[\begin{array}{cc} 1 & 0 \\ -\frac{1}{2} & 1 \end{array}\right]\left[\begin{array}{ll} 2 & 0 \\ 0 & \frac{3}{2} \end{array}\right]\left[\begin{array}{cc} 1 & -\frac{1}{2} \\ 0 & 1 \end{array}\right]=\left[\begin{array}{cc} \sqrt{2} & 0 \\ -1 / \sqrt{2} & \sqrt{3 / 2} \end{array}\right]\left[\begin{array}{cc} \sqrt{2} & -1 / \sqrt{2} \\ 0 & \sqrt{3 / 2} \end{array}\right] .	$\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array} \right]=\left[\begin{array}{cc} 1 & 0 \\ -\frac{1}{2} & 1 \end{array}\right]\left[\begin{array}{ll} 2 & 0 \\ 0 & \frac{3}{2} \end{array}\right]\left[\begin{array}{cc} 1 & -\frac{1}{2} \\ 0 & 1 \end{array}\right]=\left[\begin{array}{cc} \sqrt{2} & 0 \\ -1 / \sqrt{2} & \sqrt{3 / 2} \end{array}\right]\left[\begin{array}{cc} \sqrt{2} & -1 / \sqrt{2} \\ 0 & \sqrt{3 / 2} \end{array}\right] .$	$\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array} \right]=\left[\begin{array}{cc} 1 & 0 \\ -\frac{1}{2} & 1 \end{array}\right]\left[\begin{array}{ll} 2 & 0 \\ 0 & \frac{3}{2} \end{array}\right]\left[\begin{array}{cc} 1 & -\frac{1}{2} \\ 0 & 1 \end{array}\right]=\left[\begin{array}{cc} \sqrt{2} & 0 \\ -1 / \sqrt{2} & \sqrt{3 / 2} \end{array}\right]\left[\begin{array}{cc} \sqrt{2} & -1 / \sqrt{2} \\ 0 & \sqrt{3 / 2} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0258 (4.7)	106	1.000	\begin{figure} \captionsetup{labelformat=empty} \caption{Listing 4.2 bandcholesky} \[0<(\leq)\left(\alpha \boldsymbol{e}_{i}+\beta \boldsymbol{e}_{j}\right)^{*} \boldsymbol{A}\left(\alpha \boldsymbol{e}_{i}+\beta \boldsymbol{e}_{j} \right)=|\alpha|^{2} a_{i i}+|\beta|^{2} a_{j j}+2 \operatorname{Re}\left(\bar{\alpha} \beta a_{i j}\right) . \] \end{figure}	*(not rendered)*	$0<(\leq)(\alpha \boldsymbol{e}_{i}+\beta \boldsymbol{e}_{j})^{*} \boldsymbol{A}(\alpha \boldsymbol{e}_{i}+\beta \boldsymbol{e}_{j})=\|\alpha\|^{2} a_{i i}+\|\beta\|^{2} a_{j j}+2 \operatorname{Re}\left(\bar{\alpha} \beta a_{i j}\right).$
lyche-numerical-linear-algebra_EQ0259	106	1.000	0<\left|a_{i j}\right|^{2} a_{i i}+a_{i i}^{2} a_{j j}-2 \left|a_{i j}\right|^{2} a_{i i}=a_{i i}\left(a_{i i} a_{j j}-\left|a_{i j}\right|^{2}\right) .	$0<\left\|a_{i j}\right\|^{2} a_{i i}+a_{i i}^{2} a_{j j}-2 \left\|a_{i j}\right\|^{2} a_{i i}=a_{i i}\left(a_{i i} a_{j j}-\left\|a_{i j}\right\|^{2}\right) .$	$0<\left\|a_{i j}\right\|^{2} a_{i i}+a_{i i}^{2} a_{j j}-2 \left\|a_{i j}\right\|^{2} a_{i i}=a_{i i}\left(a_{i i} a_{j j}-\left\|a_{i j}\right\|^{2}\right) .$
lyche-numerical-linear-algebra_EQ0260	106	1.000	\left|a_{i j}\right|=\left|b_{i j}\right|<\sqrt{b_{i i} b_{j j}}=\sqrt{\left(a_{i i}+\varepsilon\right)\left(a_{j j}+\varepsilon\right)}, \quad i \neq j .	$\left\|a_{i j}\right\|=\left\|b_{i j}\right\|<\sqrt{b_{i i} b_{j j}}=\sqrt{\left(a_{i i}+\varepsilon\right)\left(a_{j j}+\varepsilon\right)}, \quad i \neq j .$	$\left\|a_{i j}\right\|=\left\|b_{i j}\right\|<\sqrt{b_{i i} b_{j j}}=\sqrt{\left(a_{i i}+\varepsilon\right)\left(a_{j j}+\varepsilon\right)}, \quad i \neq j .$
lyche-numerical-linear-algebra_EQ0261	107	1.000	\boldsymbol{A}_{1}=\left[\begin{array}{ll} 0 & 1 \\ 1 & 1 \end{array}\right], \quad \boldsymbol{A}_{2}=\left[\begin{array}{ll} 1 & 2 \\ 2 & 2 \end{array}\right], \quad \boldsymbol{A}_{3}=\left[\begin{array}{rr} -2 & 1 \\ 1 & 2 \end{array}\right] .	$\boldsymbol{A}_{1}=\left[\begin{array}{ll} 0 & 1 \\ 1 & 1 \end{array}\right], \quad \boldsymbol{A}_{2}=\left[\begin{array}{ll} 1 & 2 \\ 2 & 2 \end{array}\right], \quad \boldsymbol{A}_{3}=\left[\begin{array}{rr} -2 & 1 \\ 1 & 2 \end{array}\right] .$	$\boldsymbol{A}_{1}=\left[\begin{array}{ll} 0 & 1 \\ 1 & 1 \end{array}\right], \quad \boldsymbol{A}_{2}=\left[\begin{array}{ll} 1 & 2 \\ 2 & 2 \end{array}\right], \quad \boldsymbol{A}_{3}=\left[\begin{array}{rr} -2 & 1 \\ 1 & 2 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0266 (4.10)	109	1.000	\boldsymbol{L}^{*}:=\left[\begin{array}{cc} \beta & \boldsymbol{v}^{*} / \beta \\ \mathbf{0} & \boldsymbol{L}_{1}^{*} \end{array}\right], \quad \beta:= \sqrt{\alpha},	$\boldsymbol{L}^{*}:=\left[\begin{array}{cc} \beta & \boldsymbol{v}^{*} / \beta \\ \mathbf{0} & \boldsymbol{L}_{1}^{*} \end{array}\right], \quad \beta:= \sqrt{\alpha},$	$\boldsymbol{L}^{*}:=\left[\begin{array}{cc} \beta & \boldsymbol{v}^{*} / \beta \\ \mathbf{0} & \boldsymbol{L}_{1}^{*} \end{array}\right], \quad \beta:= \sqrt{\alpha},$
lyche-numerical-linear-algebra_EQ0271	113	1.000	\boldsymbol{x}^{T} \boldsymbol{A} \boldsymbol{x}=2 x_{1}^{2}+(2-a) x_{1} x_{2}+a x_{2} x_{1}+x_{2}^{2}=x_{1}^{2}+\left(x_{1}+x_{2}\right)^{2}>0 .	$\boldsymbol{x}^{T} \boldsymbol{A} \boldsymbol{x}=2 x_{1}^{2}+(2-a) x_{1} x_{2}+a x_{2} x_{1}+x_{2}^{2}=x_{1}^{2}+\left(x_{1}+x_{2}\right)^{2}>0 .$	$\boldsymbol{x}^{T} \boldsymbol{A} \boldsymbol{x}=2 x_{1}^{2}+(2-a) x_{1} x_{2}+a x_{2} x_{1}+x_{2}^{2}=x_{1}^{2}+\left(x_{1}+x_{2}\right)^{2}>0 .$
lyche-numerical-linear-algebra_EQ0273	114	1.000	\boldsymbol{A}=\boldsymbol{L}\left(\boldsymbol{I}+ \boldsymbol{v} \boldsymbol{v}^{T}\right) \boldsymbol{L}^{T},	$\boldsymbol{A}=\boldsymbol{L}\left(\boldsymbol{I}+ \boldsymbol{v} \boldsymbol{v}^{T}\right) \boldsymbol{L}^{T},$	$\boldsymbol{A}=\boldsymbol{L}\left(\boldsymbol{I}+ \boldsymbol{v} \boldsymbol{v}^{T}\right) \boldsymbol{L}^{T},$

Identifier	Page	Conf.	LaTeX source	Rendered	Image
lyche-numerical-linear-algebra_EQ0275	114	1.000	`\boldsymbol{L}_{+}=\left[\begin{array}{cc} \boldsymbol{L} & 0 \\ \boldsymbol{y}^{T} & \lambda \end{array}\right],`	$\boldsymbol{L}_{+}=\left[\begin{array}{cc} \boldsymbol{L} & 0 \\ \boldsymbol{y}^{T} & \lambda \end{array}\right],$	$\boldsymbol{L}_{+}=\left[\begin{array}{cc} \boldsymbol{L} & 0 \\ \boldsymbol{y}^{T} & \lambda \end{array}\right],$
lyche-numerical-linear-algebra_EQ0276	117	1.000	`\langle\boldsymbol{x}, a \boldsymbol{y}+b \boldsymbol{z} \rangle=\overline{\langle a \boldsymbol{y}+b \boldsymbol{z}, \boldsymbol{x}\rangle}=\overline{a \langle\boldsymbol{y}, \boldsymbol{x}\rangle+b\langle \boldsymbol{z}, \boldsymbol{x}\rangle}=\bar{a} \overline{ \langle\boldsymbol{y}, \boldsymbol{x}\rangle}+\overline{b \langle\boldsymbol{z}, \boldsymbol{x}\rangle}`	$\langle\boldsymbol{x}, a \boldsymbol{y}+b \boldsymbol{z} \rangle=\overline{\langle a \boldsymbol{y}+b \boldsymbol{z}, \boldsymbol{x}\rangle}=\overline{a \langle\boldsymbol{y}, \boldsymbol{x}\rangle+b\langle \boldsymbol{z}, \boldsymbol{x}\rangle}=\bar{a} \overline{ \langle\boldsymbol{y}, \boldsymbol{x}\rangle}+\overline{b \langle\boldsymbol{z}, \boldsymbol{x}\rangle}$	$\langle\boldsymbol{x}, a \boldsymbol{y}+b \boldsymbol{z} \rangle=\overline{\langle a \boldsymbol{y}+b \boldsymbol{z}, \boldsymbol{x}\rangle}=\overline{a \langle\boldsymbol{y}, \boldsymbol{x}\rangle+b\langle \boldsymbol{z}, \boldsymbol{x}\rangle}=\bar{a} \overline{ \langle\boldsymbol{y}, \boldsymbol{x}\rangle}+\overline{b \langle\boldsymbol{z}, \boldsymbol{x}\rangle}$
lyche-numerical-linear-algebra_EQ0277 (5.1)	117	1.000	`\langle\boldsymbol{x}, a \boldsymbol{y}+b \boldsymbol{z} \rangle=\bar{a}\langle\boldsymbol{x}, \boldsymbol{y} \rangle+\bar{b}\langle\boldsymbol{x}, \boldsymbol{z} \rangle, \quad\langle a \boldsymbol{x}, a \boldsymbol{y} \rangle=|a|^{2}\langle\boldsymbol{x}, \boldsymbol{y} \rangle .`	$\langle\boldsymbol{x}, a \boldsymbol{y}+b \boldsymbol{z} \rangle=\bar{a}\langle\boldsymbol{x}, \boldsymbol{y} \rangle+\bar{b}\langle\boldsymbol{x}, \boldsymbol{z} \rangle, \quad\langle a \boldsymbol{x}, a \boldsymbol{y} \rangle=\|a\|^{2}\langle\boldsymbol{x}, \boldsymbol{y} \rangle .$	$\langle\boldsymbol{x}, a \boldsymbol{y}+b \boldsymbol{z} \rangle=\bar{a}\langle\boldsymbol{x}, \boldsymbol{y} \rangle+\bar{b}\langle\boldsymbol{x}, \boldsymbol{z} \rangle, \quad\langle a \boldsymbol{x}, a \boldsymbol{y} \rangle=\|a\|^{2}\langle\boldsymbol{x}, \boldsymbol{y} \rangle .$
lyche-numerical-linear-algebra_EQ0280 (5.2)	117	1.000	`\\|\cdot\\|: \mathcal{V} \rightarrow \mathbb{R}, \quad \boldsymbol{x} \longmapsto\\|\boldsymbol{x}\\|:=\sqrt{ \langle\boldsymbol{x}, \boldsymbol{x}\rangle}`	$\\|\cdot\\|: \mathcal{V} \rightarrow \mathbb{R}, \quad \boldsymbol{x} \longmapsto\\|\boldsymbol{x}\\|:=\sqrt{ \langle\boldsymbol{x}, \boldsymbol{x}\rangle}$	$\\|\cdot\\|: \mathcal{V} \rightarrow \mathbb{R}, \quad \boldsymbol{x} \longmapsto\\|\boldsymbol{x}\\|:=\sqrt{ \langle\boldsymbol{x}, \boldsymbol{x}\rangle}$
lyche-numerical-linear-algebra_EQ0281 (5.3)	118	1.000	`|\langle\boldsymbol{x}, \boldsymbol{y}\rangle| \leq\\| \boldsymbol{x}\\|\\|\boldsymbol{y}\\|,`	$\|\langle\boldsymbol{x}, \boldsymbol{y}\rangle\| \leq\\|\boldsymbol{x}\\|\\|\boldsymbol{y}\\|,$	$\|\langle\boldsymbol{x}, \boldsymbol{y}\rangle\| \leq\\|\boldsymbol{x}\\|\\|\boldsymbol{y}\\|,$
lyche-numerical-linear-algebra_EQ0285 (5.5)	119	1.000	`\\|\boldsymbol{x}+a \boldsymbol{y}\\|^{2}=\\|\boldsymbol{x} \\|^{2}+a\langle\boldsymbol{y}, \boldsymbol{x} \rangle+\bar{a}\langle\boldsymbol{x}, \boldsymbol{y} \rangle+|a|^{2}\\|\boldsymbol{y}\\|^{2}, \quad a \in \mathbb{C}, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathcal{V} .`	$\\|\boldsymbol{x}+a \boldsymbol{y}\\|^{2}=\\|\boldsymbol{x} \\|^{2}+a\langle\boldsymbol{y}, \boldsymbol{x} \rangle+\bar{a}\langle\boldsymbol{x}, \boldsymbol{y} \rangle+\|a\|^{2}\\|\boldsymbol{y}\\|^{2}, \quad a \in \mathbb{C}, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathcal{V} .$	$\\|\boldsymbol{x}+a \boldsymbol{y}\\|^{2}=\\|\boldsymbol{x} \\|^{2}+a\langle\boldsymbol{y}, \boldsymbol{x} \rangle+\bar{a}\langle\boldsymbol{x}, \boldsymbol{y} \rangle+\|a\|^{2}\\|\boldsymbol{y}\\|^{2}, \quad a \in \mathbb{C}, \quad \boldsymbol{x}, \boldsymbol{y} \in \mathcal{V} .$
lyche-numerical-linear-algebra_EQ0287 (5.6)	119	1.000	`\cos \theta=\frac{\langle\boldsymbol{x}, \boldsymbol{y} \rangle}{\\|\boldsymbol{x}\\|\\|\boldsymbol{y}\\|} .`	$\cos \theta=\frac{\langle\boldsymbol{x}, \boldsymbol{y} \rangle}{\\|\boldsymbol{x}\\|\\|\boldsymbol{y}\\|} .$	$\cos \theta=\frac{\langle\boldsymbol{x}, \boldsymbol{y} \rangle}{\\|\boldsymbol{x}\\|\\|\boldsymbol{y}\\|} .$
lyche-numerical-linear-algebra_EQ0288 (5.7)	119	1.000	`\\|\boldsymbol{x}+\boldsymbol{y}\\|^{2}=\\|\boldsymbol{x} \\|^{2}+\\|\boldsymbol{y}\\|^{2}, \quad \text { if } \quad \boldsymbol{x} \perp \boldsymbol{y} .`	$\\|\boldsymbol{x}+\boldsymbol{y}\\|^{2}=\\|\boldsymbol{x} \\|^{2}+\\|\boldsymbol{y}\\|^{2}, \quad \text { if } \quad \boldsymbol{x} \perp \boldsymbol{y} .$	$\\|\boldsymbol{x}+\boldsymbol{y}\\|^{2}=\\|\boldsymbol{x} \\|^{2}+\\|\boldsymbol{y}\\|^{2}, \quad \text { if } \quad \boldsymbol{x} \perp \boldsymbol{y} .$
lyche-numerical-linear-algebra_EQ0290	120	1.000	`\left\{\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{k} \right\}:=\left\{\frac{\boldsymbol{v}_{1}}{\left \\|\boldsymbol{v}_{1}\right\\|}, \ldots, \frac{ \boldsymbol{v}_{k}}{\left\\|\boldsymbol{v}_{k}\right \\|}\right\}`	$\left\{\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{k} \right\}:=\left\{\frac{\boldsymbol{v}_{1}}{\left \\|\boldsymbol{v}_{1}\right\\|}, \ldots, \frac{ \boldsymbol{v}_{k}}{\left\\|\boldsymbol{v}_{k}\right \\|}\right\}$	$\left\{\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{k} \right\}:=\left\{\frac{\boldsymbol{v}_{1}}{\left \\|\boldsymbol{v}_{1}\right\\|}, \ldots, \frac{ \boldsymbol{v}_{k}}{\left\\|\boldsymbol{v}_{k}\right \\|}\right\}$
lyche-numerical-linear-algebra_EQ0291	120	1.000	`\left\langle\boldsymbol{v}_{j}, \boldsymbol{v}_{l} \right\rangle=\left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{l}\right\rangle-\sum_{i=1}^{j-1} \frac{ \left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{i} \right\rangle}{\left\langle\boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right\rangle}\left\langle \boldsymbol{v}_{i}, \boldsymbol{v}_{l}\right\rangle= \left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{l} \right\rangle-\frac{\left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{l}\right\rangle}{\left\langle \boldsymbol{v}_{l}, \boldsymbol{v}_{l}\right\rangle} \left\langle\boldsymbol{v}_{l}, \boldsymbol{v}_{l}\right\rangle=0`	$\left\langle\boldsymbol{v}_{j}, \boldsymbol{v}_{l} \right\rangle=\left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{l}\right\rangle-\sum_{i=1}^{j-1} \frac{ \left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{i} \right\rangle}{\left\langle\boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right\rangle}\left\langle \boldsymbol{v}_{i}, \boldsymbol{v}_{l}\right\rangle=\left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{l} \right\rangle-\frac{\left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{l}\right\rangle}{\left\langle \boldsymbol{v}_{l}, \boldsymbol{v}_{l}\right\rangle} \left\langle\boldsymbol{v}_{l}, \boldsymbol{v}_{l}\right\rangle=0$	$\left\langle\boldsymbol{v}_{j}, \boldsymbol{v}_{l} \right\rangle=\left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{l}\right\rangle-\sum_{i=1}^{j-1} \frac{ \left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{i} \right\rangle}{\left\langle\boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right\rangle}\left\langle \boldsymbol{v}_{i}, \boldsymbol{v}_{l}\right\rangle=\left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{l} \right\rangle-\frac{\left\langle\boldsymbol{s}_{j}, \boldsymbol{v}_{l}\right\rangle}{\left\langle \boldsymbol{v}_{l}, \boldsymbol{v}_{l}\right\rangle} \left\langle\boldsymbol{v}_{l}, \boldsymbol{v}_{l}\right\rangle=0$

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lyche-numerical-linear-algebra_EQ0292	121	1.000	`\operatorname{dim}(\mathcal{S} \oplus \mathcal{T})= \operatorname{dim}(\mathcal{S})+\operatorname{dim}( \mathcal{T}) .`	$\operatorname{dim}(\mathcal{S} \oplus \mathcal{T})= \operatorname{dim}(\mathcal{S})+\operatorname{dim}(\mathcal{T}) .$	$\operatorname{dim}(\mathcal{S} \oplus \mathcal{T})= \operatorname{dim}(\mathcal{S})+\operatorname{dim}(\mathcal{T}) .$
lyche-numerical-linear-algebra_EQ0295	122	1.000	`\left\langle\boldsymbol{s}_{0}, \boldsymbol{v}_{j}\right \rangle=\left\langle\sum_{i=1}^{k} \frac{\left\langle \boldsymbol{v}, \boldsymbol{v}_{i}\right\rangle}{\left \langle\boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right \rangle} \boldsymbol{v}_{i}, \boldsymbol{v}_{j}\right \rangle=\sum_{i=1}^{k} \frac{\left\langle\boldsymbol{v}, \boldsymbol{v}_{i}\right\rangle}{\left\langle \boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right\rangle} \left\langle\boldsymbol{v}_{i}, \boldsymbol{v}_{j}\right \rangle=\left\langle\boldsymbol{v}, \boldsymbol{v}_{j} \right\rangle .`	$\left\langle\boldsymbol{s}_{0}, \boldsymbol{v}_{j}\right \rangle=\left\langle\sum_{i=1}^{k} \frac{\left\langle \boldsymbol{v}, \boldsymbol{v}_{i}\right\rangle}{\left \langle\boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right \rangle} \boldsymbol{v}_{i}, \boldsymbol{v}_{j}\right \rangle=\sum_{i=1}^{k} \frac{\left\langle\boldsymbol{v}, \boldsymbol{v}_{i}\right\rangle}{\left\langle \boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right\rangle} \left\langle\boldsymbol{v}_{i}, \boldsymbol{v}_{j}\right \rangle=\left\langle\boldsymbol{v}, \boldsymbol{v}_{j} \right\rangle .$	$\left\langle\boldsymbol{s}_{0}, \boldsymbol{v}_{j}\right \rangle=\left\langle\sum_{i=1}^{k} \frac{\left\langle \boldsymbol{v}, \boldsymbol{v}_{i}\right\rangle}{\left \langle\boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right \rangle} \boldsymbol{v}_{i}, \boldsymbol{v}_{j}\right \rangle=\sum_{i=1}^{k} \frac{\left\langle\boldsymbol{v}, \boldsymbol{v}_{i}\right\rangle}{\left\langle \boldsymbol{v}_{i}, \boldsymbol{v}_{i}\right\rangle} \left\langle\boldsymbol{v}_{i}, \boldsymbol{v}_{j}\right \rangle=\left\langle\boldsymbol{v}, \boldsymbol{v}_{j} \right\rangle .$
lyche-numerical-linear-algebra_EQ0297	123	1.000	`|\boldsymbol{v}-\boldsymbol{s}|^{2}=\left| \boldsymbol{v}-\boldsymbol{s}_{0}+\boldsymbol{u}\right |^{2}=\left|\boldsymbol{v}-\boldsymbol{s}_{0}\right |^{2}+|\boldsymbol{u}|^{2}>\left|\boldsymbol{v}- \boldsymbol{s}_{0}\right|^{2} .`	$\|\boldsymbol{v}-\boldsymbol{s}\|^{2}=\left\| \boldsymbol{v}-\boldsymbol{s}_{0}+\boldsymbol{u}\right \|^{2}=\left\|\boldsymbol{v}-\boldsymbol{s}_{0}\right \|^{2}+\|\boldsymbol{u}\|^{2}>\left\|\boldsymbol{v}- \boldsymbol{s}_{0}\right\|^{2} .$	$\|\boldsymbol{v}-\boldsymbol{s}\|^{2}=\left\| \boldsymbol{v}-\boldsymbol{s}_{0}+\boldsymbol{u}\right \|^{2}=\left\|\boldsymbol{v}-\boldsymbol{s}_{0}\right \|^{2}+\|\boldsymbol{u}\|^{2}>\left\|\boldsymbol{v}- \boldsymbol{s}_{0}\right\|^{2} .$
lyche-numerical-linear-algebra_EQ0299	123	1.000	`\boldsymbol{e}_{i}^{T} \boldsymbol{A} \boldsymbol{e}_{j}= \left\langle\boldsymbol{A} \boldsymbol{e}_{j}, \boldsymbol{e}_{i}\right\rangle=\left\langle \boldsymbol{e}_{j}, \overline{\boldsymbol{A}} \boldsymbol{e}_{i}\right\rangle=\boldsymbol{e}_{i}^{T} \boldsymbol{A}^{T} \boldsymbol{e}_{j} .`	$\boldsymbol{e}_{i}^{T} \boldsymbol{A} \boldsymbol{e}_{j}= \left\langle\boldsymbol{A} \boldsymbol{e}_{j}, \boldsymbol{e}_{i}\right\rangle=\left\langle \boldsymbol{e}_{j}, \overline{\boldsymbol{A}} \boldsymbol{e}_{i}\right\rangle=\boldsymbol{e}_{i}^{T} \boldsymbol{A}^{T} \boldsymbol{e}_{j} .$	$\boldsymbol{e}_{i}^{T} \boldsymbol{A} \boldsymbol{e}_{j}= \left\langle\boldsymbol{A} \boldsymbol{e}_{j}, \boldsymbol{e}_{i}\right\rangle=\left\langle \boldsymbol{e}_{j}, \overline{\boldsymbol{A}} \boldsymbol{e}_{i}\right\rangle=\boldsymbol{e}_{i}^{T} \boldsymbol{A}^{T} \boldsymbol{e}_{j} .$
lyche-numerical-linear-algebra_EQ0302	124	1.000	`\boldsymbol{H}:=\boldsymbol{I}-\boldsymbol{u} \boldsymbol{u}^{*}, \text { where } \boldsymbol{u} \in \mathbb{C}^{n} \text { and } \boldsymbol{u}^{*} \boldsymbol{u}=2`	$\boldsymbol{H}:=\boldsymbol{I}-\boldsymbol{u} \boldsymbol{u}^{*}, \text { where } \boldsymbol{u} \in \mathbb{C}^{n} \text { and } \boldsymbol{u}^{*} \boldsymbol{u}=2$	$\boldsymbol{H}:=\boldsymbol{I}-\boldsymbol{u} \boldsymbol{u}^{*}, \text { where } \boldsymbol{u} \in \mathbb{C}^{n} \text { and } \boldsymbol{u}^{*} \boldsymbol{u}=2$
lyche-numerical-linear-algebra_EQ0304	124	1.000	`\boldsymbol{H}^{*} \boldsymbol{H}=\boldsymbol{H}^{2}= \left(\boldsymbol{I}-\boldsymbol{u} \boldsymbol{u}^{*} \right)\left(\boldsymbol{I}-\boldsymbol{u} \boldsymbol{u}^{*}\right)=\boldsymbol{I}-2 \boldsymbol{u} \boldsymbol{u}^{*}+\boldsymbol{u}\left(\boldsymbol{u}^{*} \boldsymbol{u}\right) \boldsymbol{u}^{*}=\boldsymbol{I} .`	$\boldsymbol{H}^{*} \boldsymbol{H}=\boldsymbol{H}^{2}= \left(\boldsymbol{I}-\boldsymbol{u} \boldsymbol{u}^{*}\right)\left(\boldsymbol{I}-\boldsymbol{u} \boldsymbol{u}^{*}\right)=\boldsymbol{I}-2 \boldsymbol{u} \boldsymbol{u}^{*}+\boldsymbol{u}\left(\boldsymbol{u}^{*} \boldsymbol{u}\right) \boldsymbol{u}^{*}=\boldsymbol{I} .$	$\boldsymbol{H}^{*} \boldsymbol{H}=\boldsymbol{H}^{2}= \left(\boldsymbol{I}-\boldsymbol{u} \boldsymbol{u}^{*}\right)\left(\boldsymbol{I}-\boldsymbol{u} \boldsymbol{u}^{*}\right)=\boldsymbol{I}-2 \boldsymbol{u} \boldsymbol{u}^{*}+\boldsymbol{u}\left(\boldsymbol{u}^{*} \boldsymbol{u}\right) \boldsymbol{u}^{*}=\boldsymbol{I} .$
lyche-numerical-linear-algebra_EQ0305 (5.12)	124	1.000	`\boldsymbol{H}:=\boldsymbol{I}-2 \frac{\boldsymbol{v} \boldsymbol{v}^{*}}{\boldsymbol{v}^{*} \boldsymbol{v}}`	$\boldsymbol{H}:=\boldsymbol{I}-2 \frac{\boldsymbol{v} \boldsymbol{v}^{*}}{\boldsymbol{v}^{*} \boldsymbol{v}}$	$\boldsymbol{H}:=\boldsymbol{I}-2 \frac{\boldsymbol{v} \boldsymbol{v}^{*}}{\boldsymbol{v}^{*} \boldsymbol{v}}$
lyche-numerical-linear-algebra_EQ0307	125	1.000	`\boldsymbol{H}=\boldsymbol{I}-\frac{2 \boldsymbol{v} \boldsymbol{v}^{*}}{\boldsymbol{v}^{*} \boldsymbol{v}}= \boldsymbol{P}-\frac{\boldsymbol{v} \boldsymbol{v}^{*}}{ \boldsymbol{v}^{*} \boldsymbol{v}}, \text { where } \boldsymbol{P}:=\boldsymbol{I}-\frac{\boldsymbol{v} \boldsymbol{v}^{*}}{\boldsymbol{v}^{*} \boldsymbol{v}},`	$\boldsymbol{H}=\boldsymbol{I}-\frac{2 \boldsymbol{v} \boldsymbol{v}^{*}}{\boldsymbol{v}^{*} \boldsymbol{v}}= \boldsymbol{P}-\frac{\boldsymbol{v} \boldsymbol{v}^{*}}{ \boldsymbol{v}^{*} \boldsymbol{v}}, \text { where } \boldsymbol{P}:=\boldsymbol{I}-\frac{\boldsymbol{v} \boldsymbol{v}^{*}}{\boldsymbol{v}^{*} \boldsymbol{v}},$	$\boldsymbol{H}=\boldsymbol{I}-\frac{2 \boldsymbol{v} \boldsymbol{v}^{*}}{\boldsymbol{v}^{*} \boldsymbol{v}}= \boldsymbol{P}-\frac{\boldsymbol{v} \boldsymbol{v}^{*}}{ \boldsymbol{v}^{*} \boldsymbol{v}}, \text { where } \boldsymbol{P}:=\boldsymbol{I}-\frac{\boldsymbol{v} \boldsymbol{v}^{*}}{\boldsymbol{v}^{*} \boldsymbol{v}},$
lyche-numerical-linear-algebra_EQ0315	128	1.000	`\left[\begin{array}{cccc} x & x & x & x \\ 0 & x & x & x & x \\ 0 & 0 & x & x \end{array}\right], \quad\left[\begin{array}{cccc} x & x & x & x \\ 0 & x & x & x & x \\ 0 & 0 & x & x \\ 0 & 0 & 0 & x \end{array}\right], \quad \left[\begin{array}{ccc} x & x & x \\ 0 & x & x \\ 0 & 0 & x \\ 0 & 0 & 0 \end{array}\right] .`	$\left[\begin{array}{cccc} x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \\ 0 & 0 & 0 & x \end{array}\right], \quad\left[\begin{array}{cccc} x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \\ 0 & 0 & 0 & x \end{array}\right], \quad \left[\begin{array}{ccc} x & x & x \\ 0 & x & x \\ 0 & 0 & x \\ 0 & 0 & 0 \end{array}\right] .$	$\left[\begin{array}{cccc} x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \\ 0 & 0 & 0 & x \end{array}\right], \quad\left[\begin{array}{cccc} x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \\ 0 & 0 & 0 & x \end{array}\right], \quad \left[\begin{array}{ccc} x & x & x \\ 0 & x & x \\ 0 & 0 & x \\ 0 & 0 & 0 \end{array}\right] .$

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lyche-numerical-linear-algebra_EQ0316	128	1.000	\boldsymbol{A}_{n+1}:=\boldsymbol{H}_{n} \boldsymbol{H}_{n-1} \cdots \boldsymbol{H}_{1} \boldsymbol{A}=\left[\begin{array}{c} \boldsymbol{R}_{1} \\ \mathbf{0} \end{array}\right]=\boldsymbol{R},	$\boldsymbol{A}_{n+1} := \boldsymbol{H}_{n} \boldsymbol{H}_{n-1} \cdots \boldsymbol{H}_{1} \boldsymbol{A} = \left[\begin{array}{c} \boldsymbol{R}_{1} \\ \mathbf{0} \end{array} \right] = \boldsymbol{R},$	$\boldsymbol{A}_{n+1} := \boldsymbol{H}_{n} \boldsymbol{H}_{n-1} \cdots \boldsymbol{H}_{1} \boldsymbol{A} = \left[\begin{array}{c} \boldsymbol{R}_{1} \\ \mathbf{0} \end{array} \right] = \boldsymbol{R},$
lyche-numerical-linear-algebra_EQ0317	128	1.000	\boldsymbol{A}_{1}:=\boldsymbol{A}, \quad \boldsymbol{A}_{k+1}=\boldsymbol{H}_{k} \boldsymbol{A}_{k}, \quad k=1,2, \ldots, n .	$\boldsymbol{A}_{1} := \boldsymbol{A}, \quad \boldsymbol{A}_{k+1} = \boldsymbol{H}_{k} \boldsymbol{A}_{k}, \quad k = 1, 2, \ldots, n .$	$\boldsymbol{A}_{1} := \boldsymbol{A}, \quad \boldsymbol{A}_{k+1} = \boldsymbol{H}_{k} \boldsymbol{A}_{k}, \quad k = 1, 2, \ldots, n .$
lyche-numerical-linear-algebra_EQ0319	129	1.000	\boldsymbol{A}_{k+1}:=\boldsymbol{H}_{k} \boldsymbol{A}_{k}=\left[\begin{array}{cc} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \\ \mathbf{0} & \hat{\boldsymbol{H}}_{k} \boldsymbol{D}_{k} \end{array} \right]=\left[\begin{array}{cc} \boldsymbol{B}_{k+1} & \boldsymbol{C}_{k+1} \\ \mathbf{0} & \boldsymbol{D}_{k+1} \end{array}\right],	$\boldsymbol{A}_{k+1} := \boldsymbol{H}_{k} \boldsymbol{A}_{k} = \left[\begin{array}{cc} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \\ \mathbf{0} & \hat{\boldsymbol{H}}_{k} \boldsymbol{D}_{k} \end{array} \right] = \left[\begin{array}{cc} \boldsymbol{B}_{k+1} & \boldsymbol{C}_{k+1} \\ \mathbf{0} & \boldsymbol{D}_{k+1} \end{array} \right],$	$\boldsymbol{A}_{k+1} := \boldsymbol{H}_{k} \boldsymbol{A}_{k} = \left[\begin{array}{cc} \boldsymbol{B}_{k} & \boldsymbol{C}_{k} \\ \mathbf{0} & \hat{\boldsymbol{H}}_{k} \boldsymbol{D}_{k} \end{array} \right] = \left[\begin{array}{cc} \boldsymbol{B}_{k+1} & \boldsymbol{C}_{k+1} \\ \mathbf{0} & \boldsymbol{D}_{k+1} \end{array} \right],$
lyche-numerical-linear-algebra_EQ0322	131	1.000	\boldsymbol{R}=\left[\begin{array}{c} \boldsymbol{R}_{1} \\ \mathbf{0}_{m-n, n} \end{array}\right]	$\boldsymbol{R} = \left[\begin{array}{c} \boldsymbol{R}_{1} \\ \mathbf{0}_{m-n, n} \end{array} \right]$	$\boldsymbol{R} = \left[\begin{array}{c} \boldsymbol{R}_{1} \\ \mathbf{0}_{m-n, n} \end{array} \right]$
lyche-numerical-linear-algebra_EQ0325 (5.17)	133	1.000	\boldsymbol{v}_{1}=\boldsymbol{a}_{1}, \quad \boldsymbol{v}_{j}=\boldsymbol{a}_{j}-\sum_{i=1}^{j-1} \frac{\boldsymbol{a}_{j}^{T} \boldsymbol{v}_{i}}{ \boldsymbol{v}_{i}^{T} \boldsymbol{v}_{i}} \boldsymbol{v}_{i}, \quad \text { for } j=2, \ldots, n .	$\boldsymbol{v}_{1} = \boldsymbol{a}_{1}, \quad \boldsymbol{v}_{j} = \boldsymbol{a}_{j} - \sum_{i=1}^{j-1} \frac{\boldsymbol{a}_{j}^{T} \boldsymbol{v}_{i}}{ \boldsymbol{v}_{i}^{T} \boldsymbol{v}_{i}} \boldsymbol{v}_{i}, \quad \text{ for } j = 2, \ldots, n .$	$\boldsymbol{v}_{1} = \boldsymbol{a}_{1}, \quad \boldsymbol{v}_{j} = \boldsymbol{a}_{j} - \sum_{i=1}^{j-1} \frac{\boldsymbol{a}_{j}^{T} \boldsymbol{v}_{i}}{ \boldsymbol{v}_{i}^{T} \boldsymbol{v}_{i}} \boldsymbol{v}_{i}, \quad \text{ for } j = 2, \ldots, n .$
lyche-numerical-linear-algebra_EQ0327	133	1.000	\boldsymbol{a}_{j}=\boldsymbol{v}_{j}+\sum_{i=1}^{j-1} \frac{\boldsymbol{a}_{j}^{T} \boldsymbol{v}_{i}}{ \boldsymbol{v}_{i}^{T} \boldsymbol{v}_{i}} \boldsymbol{v}_{i}=r_{j j} \boldsymbol{q}_{j}+ \sum_{i=1}^{j-1} \boldsymbol{q}_{i} r_{i j}= \boldsymbol{Q}_{1} \boldsymbol{R}_{1} \boldsymbol{e}_{j}, j=1, \ldots, n .	$\boldsymbol{a}_{j} = \boldsymbol{v}_{j} + \sum_{i=1}^{j-1} \frac{\boldsymbol{a}_{j}^{T} \boldsymbol{v}_{i}}{ \boldsymbol{v}_{i}^{T} \boldsymbol{v}_{i}} \boldsymbol{v}_{i} = r_{jj} \boldsymbol{q}_{j} + \sum_{i=1}^{j-1} \boldsymbol{q}_{i} r_{ij} = \boldsymbol{Q}_{1} \boldsymbol{R}_{1} \boldsymbol{e}_{j}, j = 1, \ldots, n .$	$\boldsymbol{a}_{j} = \boldsymbol{v}_{j} + \sum_{i=1}^{j-1} \frac{\boldsymbol{a}_{j}^{T} \boldsymbol{v}_{i}}{ \boldsymbol{v}_{i}^{T} \boldsymbol{v}_{i}} \boldsymbol{v}_{i} = r_{jj} \boldsymbol{q}_{j} + \sum_{i=1}^{j-1} \boldsymbol{q}_{i} r_{ij} = \boldsymbol{Q}_{1} \boldsymbol{R}_{1} \boldsymbol{e}_{j}, \ j = 1, \ldots, n .$
lyche-numerical-linear-algebra_EQ0333	135	1.000	\left[\begin{array}{cc} p_{i i} & p_{i j} \\ p_{j i} & p_{j j} \end{array}\right]=\left[\begin{array}{cc} c & s \\ -s & c \end{array}\right], \text { where } c^{2}+s^{2}=1 .	$\left[\begin{array}{cc} p_{i i} & p_{i j} \\ p_{j i} & p_{j j} \end{array} \right] = \left[\begin{array}{cc} c & s \\ -s & c \end{array} \right], \text{ where } c^{2} + s^{2} = 1 .$	$\left[\begin{array}{cc} p_{i i} & p_{i j} \\ p_{j i} & p_{j j} \end{array} \right] = \left[\begin{array}{cc} c & s \\ -s & c \end{array} \right], \text{ where } c^{2} + s^{2} = 1 .$
lyche-numerical-linear-algebra_EQ0334	135	1.000	\boldsymbol{P}_{12}=\left[\begin{array}{cccc} c & s & 0 & 0 \\ -s & c & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right], \quad \boldsymbol{P}_{13}=\left[\begin{array}{cccc} c & 0 & s & 0 \\ 0 & 1 & 0 & 0 \\ -s & 0 & c & 0 \\ 0 & 0 & 0 & 1 \end{array}\right], \quad \boldsymbol{P}_{23}=\left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & s & c & 0 \\ 0 & -s & c & 0 \\ 0 & 0 & 0 & 1 \end{array}\right] .	$\boldsymbol{P}_{12} = \left[\begin{array}{cccc} c & s & 0 & 0 \\ -s & c & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array} \right], \quad \boldsymbol{P}_{13} = \left[\begin{array}{cccc} c & 0 & s & 0 \\ 0 & 1 & 0 & 0 \\ -s & 0 & c & 0 \\ 0 & 0 & 0 & 1 \end{array} \right], \quad \boldsymbol{P}_{23} = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & s & c & 0 \\ 0 & -s & c & 0 \\ 0 & 0 & 0 & 1 \end{array} \right] .$	$\boldsymbol{P}_{12} = \left[\begin{array}{cccc} c & s & 0 & 0 \\ -s & c & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array} \right], \quad \boldsymbol{P}_{13} = \left[\begin{array}{cccc} c & 0 & s & 0 \\ 0 & 1 & 0 & 0 \\ -s & 0 & c & 0 \\ 0 & 0 & 0 & 1 \end{array} \right], \quad \boldsymbol{P}_{23} = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & s & c & 0 \\ 0 & -s & c & 0 \\ 0 & 0 & 0 & 1 \end{array} \right] .$
lyche-numerical-linear-algebra_EQ0337 (5.20)	136	1.000	\cos \theta=\frac{|\langle\boldsymbol{x}, \boldsymbol{y} \rangle|}{\\|\boldsymbol{x}\\|\\|\boldsymbol{y}\\|} .	$\cos \theta = \frac{\|\langle \boldsymbol{x}, \boldsymbol{y} \rangle\|}{\\|\boldsymbol{x}\\|\\|\boldsymbol{y}\\|} .$	$\cos \theta = \frac{\|\langle \boldsymbol{x}, \boldsymbol{y} \rangle\|}{\\|\boldsymbol{x}\\|\\|\boldsymbol{y}\\|} .$

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lyche-numerical-linear-algebra_EQ0339	137	1.000	`\boldsymbol{H}=\left[\begin{array}{cc} -\cos \phi & \sin \phi \\ \sin \phi & \cos \phi \end{array}\right] .`	$\boldsymbol{H} = \left[\begin{array}{cc} -\cos \phi & \sin \phi \\ \sin \phi & \cos \phi \end{array}\right] .$	$\boldsymbol{H} = \left[\begin{array}{cc} -\cos \phi & \sin \phi \\ \sin \phi & \cos \phi \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0340	137	1.000	`\boldsymbol{H} \boldsymbol{x}=\boldsymbol{y}, \quad \text{ where } \quad \boldsymbol{H}:=\boldsymbol{I}-2 \frac{ \boldsymbol{v} \boldsymbol{v}^{T}}{\boldsymbol{v}^{T} \boldsymbol{v}} .`	$\boldsymbol{H} \boldsymbol{x}=\boldsymbol{y}, \quad \text{ where } \quad \boldsymbol{H}:=\boldsymbol{I}-2 \frac{ \boldsymbol{v} \boldsymbol{v}^{T}}{\boldsymbol{v}^{T} \boldsymbol{v}} .$	$\boldsymbol{H} \boldsymbol{x}=\boldsymbol{y}, \quad \text{ where } \quad \boldsymbol{H}:=\boldsymbol{I}-2 \frac{ \boldsymbol{v} \boldsymbol{v}^{T}}{\boldsymbol{v}^{T} \boldsymbol{v}} .$
lyche-numerical-linear-algebra_EQ0343	137	1.000	`A:=\left[\begin{array}{ccc} 1 & 0 & 1 \\ -2 & -1 & 0 \\ 2 & 2 & 1 \end{array}\right] .`	$A:=\left[\begin{array}{ccc} 1 & 0 & 1 \\ -2 & -1 & 0 \\ 2 & 2 & 1 \end{array}\right] .$	$\boldsymbol{A}:=\left[\begin{array}{ccc} 1 & 0 & 1 \\ -2 & -1 & 0 \\ 2 & 2 & 1 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0344 (5.21)	138	1.000	`|\operatorname{det}(\boldsymbol{A})| \leq \prod_{j=1}^{n} \left\\|\boldsymbol{a}_{j}\right\\|_{2} .`	$\|\operatorname{det}(\boldsymbol{A})\| \leq \prod_{j=1}^{n} \left\\|\boldsymbol{a}_{j}\right\\|_{2} .$	$\|\operatorname{det}(\boldsymbol{A})\| \leq \prod_{j=1}^{n} \left\\|\boldsymbol{a}_{j}\right\\|_{2} .$
lyche-numerical-linear-algebra_EQ0346	139	1.000	`A:=\left[\begin{array}{rr} 2 & 1 \\ 2 & -3 \\ -2 & -1 \\ -2 & 3 \end{array}\right]`	$A:=\left[\begin{array}{rr} 2 & 1 \\ 2 & -3 \\ -2 & -1 \\ -2 & 3 \end{array}\right]$	$\boldsymbol{A}:=\left[\begin{array}{rr} 2 & 1 \\ 2 & -3 \\ -2 & -1 \\ -2 & 3 \end{array}\right]$
lyche-numerical-linear-algebra_EQ0347	140	1.000	`\boldsymbol{G}_{3} \boldsymbol{G}_{2} \boldsymbol{G}_{1} \boldsymbol{H}=\boldsymbol{R}`	$\boldsymbol{G}_{3} \boldsymbol{G}_{2} \boldsymbol{G}_{1} \boldsymbol{H}=\boldsymbol{R}$	$\boldsymbol{G}_{3} \boldsymbol{G}_{2} \boldsymbol{G}_{1} \boldsymbol{H}=\boldsymbol{R}$
lyche-numerical-linear-algebra_EQ0349	141	1.000	`\boldsymbol{P}=\left[\begin{array}{cc} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{array}\right]`	$\boldsymbol{P}=\left[\begin{array}{cc} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{array}\right]$	$\boldsymbol{P}=\left[\begin{array}{cc} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{array}\right]$
lyche-numerical-linear-algebra_EQ0351	141	1.000	`\left(a_{1,1}, a_{2,2}, \ldots, a_{n, n}\right)`	$\left(a_{1,1}, a_{2,2}, \ldots, a_{n, n}\right)$	$\left(a_{1,1}, a_{2,2}, \ldots, a_{n, n}\right)$
lyche-numerical-linear-algebra_EQ0352	141	1.000	`\left(a_{2,1}, a_{3,2}, \ldots, a_{n, n-1}\right) .`	$\left(a_{2,1}, a_{3,2}, \ldots, a_{n, n-1}\right) .$	$\left(a_{2,1}, a_{3,2}, \ldots, a_{n, n-1}\right) .$
lyche-numerical-linear-algebra_EQ0353	142	1.000	`\boldsymbol{P}_{m-1, m} \boldsymbol{P}_{m-2, m-1} \cdots \boldsymbol{P}_{2,3} \boldsymbol{P}_{1,2} \boldsymbol{H}`	$\boldsymbol{P}_{m-1, m} \boldsymbol{P}_{m-2, m-1} \cdots \boldsymbol{P}_{2,3} \boldsymbol{P}_{1,2} \boldsymbol{H}$	$\boldsymbol{P}_{m-1, m} \boldsymbol{P}_{m-2, m-1} \cdots \boldsymbol{P}_{2,3} \boldsymbol{P}_{1,2} \boldsymbol{H}$
lyche-numerical-linear-algebra_EQ0356	145	1.000	`\pi_{\boldsymbol{A}}(\lambda)=\operatorname{det}( \boldsymbol{A}-\lambda \boldsymbol{I}) .`	$\pi_{\boldsymbol{A}}(\lambda)=\operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I}) .$	$\pi_{\boldsymbol{A}}(\lambda)=\operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I}) .$
lyche-numerical-linear-algebra_EQ0357	146	1.000	`\sum_{j=1}^{m} c_{j} \boldsymbol{x}_{j}=\mathbf{0} \Rightarrow \sum_{j=1}^{m} c_{j} \boldsymbol{A} \boldsymbol{x}_{j}=\sum_{j=1}^{m} c_{j} \lambda_{j} \boldsymbol{x}_{j}=\mathbf{0} .`	$\sum_{j=1}^{m} c_{j} \boldsymbol{x}_{j}=\mathbf{0} \Rightarrow \sum_{j=1}^{m} c_{j} \boldsymbol{A} \boldsymbol{x}_{j}=\sum_{j=1}^{m} c_{j} \lambda_{j} \boldsymbol{x}_{j}=\mathbf{0} .$	$\sum_{j=1}^{m} c_{j} \boldsymbol{x}_{j}=\mathbf{0} \Rightarrow \sum_{j=1}^{m} c_{j} \boldsymbol{A} \boldsymbol{x}_{j}=\sum_{j=1}^{m} c_{j} \lambda_{j} \boldsymbol{x}_{j}=\mathbf{0} .$
lyche-numerical-linear-algebra_EQ0358	146	1.000	`\boldsymbol{I}:=\left[\begin{array}{ll} 1 & 0 \\ 0 & 1 \end{array}\right], \quad \boldsymbol{J}:=\left[ \begin{array}{ll} 1 & 1 \\ 0 & 1 \end{array}\right] .`	$\boldsymbol{I}:=\left[\begin{array}{ll} 1 & 0 \\ 0 & 1 \end{array}\right], \quad \boldsymbol{J}:=\left[\begin{array}{ll} 1 & 1 \\ 0 & 1 \end{array}\right] .$	$\boldsymbol{I}:=\left[\begin{array}{ll} 1 & 0 \\ 0 & 1 \end{array}\right], \quad \boldsymbol{J}:=\left[\begin{array}{ll} 1 & 1 \\ 0 & 1 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0359	146	1.000	`\boldsymbol{x}=\sum_{j=1}^{n} c_{j} \boldsymbol{x}_{j} \text { for some scalars } c_{1}, \ldots, c_{n}`	$\boldsymbol{x}=\sum_{j=1}^{n} c_{j} \boldsymbol{x}_{j} \text { for some scalars } c_{1}, \ldots, c_{n}$	$\boldsymbol{x}=\sum_{j=1}^{n} c_{j} \boldsymbol{x}_{j} \text { for some scalars } c_{1}, \ldots, c_{n}$
lyche-numerical-linear-algebra_EQ0360	146	1.000	`\boldsymbol{x}=\frac{x_{1}+x_{2}}{2}\left[ \begin{array}{l} 1 \\ 1 \end{array}\right]+ \frac{x_{1}-x_{2}}{2}\left[\begin{array}{c} 1 \\ -1 \end{array}\right] .`	$\boldsymbol{x}=\frac{x_{1}+x_{2}}{2}\left[\begin{array}{l} 1 \\ 1 \end{array}\right]+ \frac{x_{1}-x_{2}}{2}\left[\begin{array}{c} 1 \\ -1 \end{array}\right] .$	$\boldsymbol{x}=\frac{x_{1}+x_{2}}{2}\left[\begin{array}{l} 1 \\ 1 \end{array}\right]+ \frac{x_{1}-x_{2}}{2}\left[\begin{array}{c} 1 \\ -1 \end{array}\right] .$

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lyche-numerical-linear-algebra_EQ0365 (6.3)	148	1.000	`\mathcal{N}(\boldsymbol{A}-\lambda \boldsymbol{I}):= \left\{\boldsymbol{x} \in \mathbb{C}^{n}:(\boldsymbol{A}-\lambda \boldsymbol{I}) \boldsymbol{x}=\mathbf{0}\right\}`	$\mathcal{N}(\boldsymbol{A}-\lambda \boldsymbol{I}):=\left\{\boldsymbol{x} \in \mathbb{C}^{n}:(\boldsymbol{A}-\lambda \boldsymbol{I}) \boldsymbol{x}=\mathbf{0}\right\}$	$\mathcal{N}(\boldsymbol{A}-\lambda \boldsymbol{I}):=\left\{\boldsymbol{x} \in \mathbb{C}^{n}:(\boldsymbol{A}-\lambda \boldsymbol{I}) \boldsymbol{x}=\mathbf{0}\right\}$
lyche-numerical-linear-algebra_EQ0368 (6.6)	150	1.000	`\boldsymbol{U}_{i}=\operatorname{diag}\left( \boldsymbol{J}_{m_{i, 1}}\left(\lambda_{i}\right), \ldots, \boldsymbol{J}_{m_{i, g_{i}}}\left(\lambda_{i} \right)\right) .`	$\boldsymbol{U}_{i}=\operatorname{diag}\left(\boldsymbol{J}_{m_{i, 1}}\left(\lambda_{i}\right), \ldots, \boldsymbol{J}_{m_{i, g_{i}}}\left(\lambda_{i}\right)\right) .$	$\boldsymbol{U}_{i}=\operatorname{diag}(\boldsymbol{J}_{m_{i, 1}}(\lambda_{i}), \ldots, \boldsymbol{J}_{m_{i, g_{i}}}(\lambda_{i})).$
lyche-numerical-linear-algebra_EQ0372	152	1.000	`\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{V} \boldsymbol{e}_{1}=\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{v}_{1}=\lambda_{1} \boldsymbol{V}^{*} \boldsymbol{v}_{1}=\lambda_{1} \boldsymbol{e}_{1} .`	$\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{V} \boldsymbol{e}_{1}=\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{v}_{1}=\lambda_{1} \boldsymbol{V}^{*} \boldsymbol{v}_{1}=\lambda_{1} \boldsymbol{e}_{1} .$	$\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{V} \boldsymbol{e}_{1}=\boldsymbol{V}^{*} \boldsymbol{A} \boldsymbol{v}_{1}=\lambda_{1} \boldsymbol{V}^{*} \boldsymbol{v}_{1}=\lambda_{1} \boldsymbol{e}_{1} .$
lyche-numerical-linear-algebra_EQ0376	153	1.000	`\boldsymbol{V}=\left[\begin{array}{ccc} -\frac{1}{ \sqrt{2}} & 0 & \frac{1}{\sqrt{2}} \\ 0 & 1 & 0 \\ \frac{1}{\sqrt{2}} & 0 & \frac{1}{\sqrt{2}} \end{array} \right] .`	$\boldsymbol{V}=\left[\begin{array}{ccc} -\frac{1}{ \sqrt{2}} & 0 & \frac{1}{\sqrt{2}} \\ 0 & 1 & 0 \\ \frac{1}{\sqrt{2}} & 0 & \frac{1}{\sqrt{2}} \end{array} \right] .$	$\boldsymbol{V}=\left[\begin{array}{ccc} -\frac{1}{ \sqrt{2}} & 0 & \frac{1}{\sqrt{2}} \\ 0 & 1 & 0 \\ \frac{1}{\sqrt{2}} & 0 & \frac{1}{\sqrt{2}} \end{array} \right] .$
lyche-numerical-linear-algebra_EQ0377	153	1.000	`\boldsymbol{M}=\left[\begin{array}{cc} 2 & -\sqrt{2} \\ -\sqrt{2} & 2 \end{array}\right] .`	$\boldsymbol{M}=\left[\begin{array}{cc} 2 & -\sqrt{2} \\ -\sqrt{2} & 2 \end{array}\right] .$	$\boldsymbol{M}=\left[\begin{array}{cc} 2 & -\sqrt{2} \\ -\sqrt{2} & 2 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0378	153	1.000	`\boldsymbol{A}^{*} \boldsymbol{A}=\operatorname{diag} \left(\overline{d_{1}} d_{1}, \ldots, \overline{d_{n}} d_{n}\right)=\operatorname{diag}\left(\left|d_{1} \right|^{2}, \ldots,\left|d_{n}\right|^{2}\right)= \boldsymbol{A} \boldsymbol{A}^{*},`	$\boldsymbol{A}^{*} \boldsymbol{A}=\operatorname{diag} \left(\overline{d_{1}} d_{1}, \ldots, \overline{d_{n}} d_{n}\right)=\operatorname{diag}\left(\left\|d_{1}\right\|^{2}, \ldots,\left\|d_{n}\right\|^{2}\right)=\boldsymbol{A} \boldsymbol{A}^{*},$	$\boldsymbol{A}^{*} \boldsymbol{A}=\operatorname{diag}(\overline{d_{1}} d_{1}, \ldots, \overline{d_{n}} d_{n})=\operatorname{diag}(\left\|d_{1}\right\|^{2}, \ldots,\left\|d_{n}\right\|^{2})=\boldsymbol{A} \boldsymbol{A}^{*},$
lyche-numerical-linear-algebra_EQ0382	154	1.000	`e_{i i}=\sum_{k=1}^{i}\left|b_{k i}\right|^{2}=\left|b_{i i}\right|^{2}=\sum_{k=i}^{n}\left|b_{i k}\right|^{2}=f_{i i}`	$e_{i i}=\sum_{k=1}^{i}\left\|b_{k i}\right\|^{2}=\left\|b_{i i}\right\|^{2}=\sum_{k=i}^{n}\left\|b_{i k}\right\|^{2}=f_{i i}$	$e_{i i}=\sum_{k=1}^{i}\left\|b_{k i}\right\|^{2}=\left\|b_{i i}\right\|^{2}=\sum_{k=i}^{n}\left\|b_{i k}\right\|^{2}=f_{i i}$
lyche-numerical-linear-algebra_EQ0385 (6.10)	155	1.000	`\boldsymbol{M}=\left[\begin{array}{cc} \mu & v \\ -v & \mu \end{array}\right]`	$\boldsymbol{M}=\left[\begin{array}{cc} \mu & v \\ -v & \mu \end{array}\right]$	$\boldsymbol{M}=\left[\begin{array}{cc} \mu & v \\ -v & \mu \end{array}\right]$
lyche-numerical-linear-algebra_EQ0388	156	1.000	`\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U}= \operatorname{diag}\left(\lambda_{1}, \ldots, \lambda_{n} \right) .`	$\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U}=\operatorname{diag}\left(\lambda_{1}, \ldots, \lambda_{n}\right) .$	$\boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{U}=\operatorname{diag}(\lambda_{1}, \ldots, \lambda_{n}).$
lyche-numerical-linear-algebra_EQ0389	156	1.000	`\boldsymbol{U}^{T} \boldsymbol{A} \boldsymbol{U}= \operatorname{diag}\left(\lambda_{1}, \lambda_{2}, \ldots, \lambda_{n}\right) .`	$\boldsymbol{U}^{T} \boldsymbol{A} \boldsymbol{U}=\operatorname{diag}\left(\lambda_{1}, \lambda_{2}, \ldots, \lambda_{n}\right) .$	$\boldsymbol{U}^{T} \boldsymbol{A} \boldsymbol{U}=\operatorname{diag}(\lambda_{1}, \lambda_{2}, \ldots, \lambda_{n}).$
lyche-numerical-linear-algebra_EQ0391	157	1.000	`\operatorname{dim}\left(\mathcal{S} \cap \mathcal{S}^{ \prime}\right)=\operatorname{dim}(\mathcal{S})+ \operatorname{dim}\left(\mathcal{S}^{\prime}\right)- \operatorname{dim}\left(\mathcal{S}+\mathcal{S}^{\prime} \right) \geq(n-k+1)+k-n=1 .`	$\operatorname{dim}\left(\mathcal{S} \cap \mathcal{S}^{\prime}\right)=\operatorname{dim}(\mathcal{S})+\operatorname{dim}\left(\mathcal{S}^{\prime}\right)-\operatorname{dim}\left(\mathcal{S}+\mathcal{S}^{\prime}\right) \geq(n-k+1)+k-n=1 .$	$\operatorname{dim}(\mathcal{S} \cap \mathcal{S}^{\prime})=\operatorname{dim}(\mathcal{S})+\operatorname{dim}(\mathcal{S}^{\prime})-\operatorname{dim}(\mathcal{S}+\mathcal{S}^{\prime}) \geq(n-k+1)+k-n=1 .$
lyche-numerical-linear-algebra_EQ0395 (6.14)	158	1.000	`\alpha_{k}+\varepsilon_{n} \leq \beta_{k} \leq \alpha_{k}+\varepsilon_{1}, \text { for } k=1, \ldots, n,`	$\alpha_{k}+\varepsilon_{n} \leq \beta_{k} \leq \alpha_{k}+\varepsilon_{1}, \text { for } k=1, \ldots, n,$	$\alpha_{k}+\varepsilon_{n} \leq \beta_{k} \leq \alpha_{k}+\varepsilon_{1}, \text { for } k=1, \ldots, n,$
lyche-numerical-linear-algebra_EQ0398 (6.16)	159	1.000	`\boldsymbol{v}=\sum_{j=1}^{n} \frac{ \boldsymbol{y}_{j}^{*} \boldsymbol{v}}{ \boldsymbol{y}_{j}^{*} \boldsymbol{x}_{j}} \boldsymbol{x}_{j}=\sum_{k=1}^{n} \frac{ \boldsymbol{x}_{k}^{*} \boldsymbol{v}}{ \boldsymbol{y}_{k}^{*} \boldsymbol{x}_{k}} \boldsymbol{y}_{k}, \quad \boldsymbol{v} \in \mathbb{C}^{n}`	$\boldsymbol{v}=\sum_{j=1}^{n} \frac{ \boldsymbol{y}_{j}^{*} \boldsymbol{v}}{ \boldsymbol{y}_{j}^{*} \boldsymbol{x}_{j}} \boldsymbol{x}_{j}=\sum_{k=1}^{n} \frac{ \boldsymbol{x}_{k}^{*} \boldsymbol{v}}{ \boldsymbol{y}_{k}^{*} \boldsymbol{x}_{k}} \boldsymbol{y}_{k}, \quad \boldsymbol{v} \in \mathbb{C}^{n}$	$\boldsymbol{v}=\sum_{j=1}^{n} \frac{ \boldsymbol{y}_{j}^{*} \boldsymbol{v}}{ \boldsymbol{y}_{j}^{*} \boldsymbol{x}_{j}} \boldsymbol{x}_{j}=\sum_{k=1}^{n} \frac{ \boldsymbol{x}_{k}^{*} \boldsymbol{v}}{ \boldsymbol{y}_{k}^{*} \boldsymbol{x}_{k}} \boldsymbol{y}_{k}, \quad \boldsymbol{v} \in \mathbb{C}^{n}.$

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lyche-numerical-linear-algebra_EQ0399	160	1.000	`\boldsymbol{X}:=\left[\boldsymbol{x}_{1}, \ldots, \boldsymbol{x}_{n}\right], \quad \boldsymbol{Y}:= \left[\boldsymbol{y}_{1}, \ldots, \boldsymbol{y}_{n} \right], \quad \boldsymbol{D}:=\operatorname{diag}\left( \lambda_{1}, \ldots, \lambda_{n}\right) .`	$\boldsymbol{X} := [\boldsymbol{x}_1, \ldots, \boldsymbol{x}_n], \quad \boldsymbol{Y} := [\boldsymbol{y}_1, \ldots, \boldsymbol{y}_n], \quad \boldsymbol{D} := \operatorname{diag}(\lambda_1, \ldots, \lambda_n).$	$\boldsymbol{X} := [\boldsymbol{x}_1, \ldots, \boldsymbol{x}_n], \quad \boldsymbol{Y} := [\boldsymbol{y}_1, \ldots, \boldsymbol{y}_n], \quad \boldsymbol{D} := \operatorname{diag}(\lambda_1, \ldots, \lambda_n).$
lyche-numerical-linear-algebra_EQ0400 (6.17)	160	1.000	`\boldsymbol{v}=\sum_{j=1}^{n} \frac{ \boldsymbol{x}_{j}^{*} \boldsymbol{v}}{ \boldsymbol{x}_{j}^{*} \boldsymbol{x}_{j}} \boldsymbol{x}_{j} .`	$\boldsymbol{v}=\sum_{j=1}^{n} \frac{ \boldsymbol{x}_{j}^{*} \boldsymbol{v}}{ \boldsymbol{x}_{j}^{*} \boldsymbol{x}_{j}} \boldsymbol{x}_{j} .$	$\boldsymbol{v}=\sum_{j=1}^{n} \frac{ \boldsymbol{x}_{j}^{*} \boldsymbol{v}}{ \boldsymbol{x}_{j}^{*} \boldsymbol{x}_{j}} \boldsymbol{x}_{j} .$
lyche-numerical-linear-algebra_EQ0402	161	1.000	`\left(\boldsymbol{V}^{*} \boldsymbol{A}^{*} \boldsymbol{V}\right) \boldsymbol{u}=\boldsymbol{V}^{*} \boldsymbol{A}^{*} \boldsymbol{y}=\bar{\lambda} \boldsymbol{V}^{*} \boldsymbol{y}=\bar{\lambda} \boldsymbol{u},`	$\left(\boldsymbol{V}^{*} \boldsymbol{A}^{*} \boldsymbol{V}\right) \boldsymbol{u}=\boldsymbol{V}^{*} \boldsymbol{A}^{*} \boldsymbol{y}=\bar{\lambda} \boldsymbol{V}^{*} \boldsymbol{y}=\bar{\lambda} \boldsymbol{u},$	$\left(\boldsymbol{V}^{*} \boldsymbol{A}^{*} \boldsymbol{V}\right) \boldsymbol{u}=\boldsymbol{V}^{*} \boldsymbol{A}^{*} \boldsymbol{y}=\bar{\lambda} \boldsymbol{V}^{*} \boldsymbol{y}=\bar{\lambda} \boldsymbol{u},$
lyche-numerical-linear-algebra_EQ0405 (6.18)	162	1.000	`\boldsymbol{A}^{k} \boldsymbol{x}=\sum_{j=1}^{n} c_{j} \lambda_{j}^{k} \boldsymbol{x}_{j} \text { for some scalars } c_{1}, \ldots, c_{n}`	$\boldsymbol{A}^{k} \boldsymbol{x}=\sum_{j=1}^{n} c_{j} \lambda_{j}^{k} \boldsymbol{x}_{j} \text { for some scalars } c_{1}, \ldots, c_{n}$	$\boldsymbol{A}^{k} \boldsymbol{x}=\sum_{j=1}^{n} c_{j} \lambda_{j}^{k} \boldsymbol{x}_{j} \text { for some scalars } c_{1}, \ldots, c_{n}.$
lyche-numerical-linear-algebra_EQ0411	164	1.000	`p(\boldsymbol{A}):=\sum_{j=0}^{r} b_{j} \boldsymbol{A}^{j},`	$p(\boldsymbol{A}):=\sum_{j=0}^{r} b_{j} \boldsymbol{A}^{j},$	$p(\boldsymbol{A}):=\sum_{j=0}^{r} b_{j} \boldsymbol{A}^{j},$
lyche-numerical-linear-algebra_EQ0417 (7.1)	168	1.000	`\boldsymbol{A}=\boldsymbol{U} \boldsymbol{D} \boldsymbol{U}^{*}, \text { where } \boldsymbol{U}^{*} \boldsymbol{U}=\boldsymbol{I} .`	$\boldsymbol{A}=\boldsymbol{U} \boldsymbol{D} \boldsymbol{U}^{*}, \text { where } \boldsymbol{U}^{*} \boldsymbol{U}=\boldsymbol{I} .$	$\boldsymbol{A}=\boldsymbol{U} \boldsymbol{D} \boldsymbol{U}^{*}, \text { where } \boldsymbol{U}^{*} \boldsymbol{U}=\boldsymbol{I} .$
lyche-numerical-linear-algebra_EQ0419	169	1.000	`\lambda_{1} \geq \cdots \geq \lambda_{r}>0=\lambda_{r+1}= \cdots=\lambda_{n} .`	$\lambda_{1} \geq \cdots \geq \lambda_{r}>0=\lambda_{r+1}= \cdots=\lambda_{n} .$	$\lambda_{1} \geq \cdots \geq \lambda_{r}>0=\lambda_{r+1}= \cdots=\lambda_{n} .$
lyche-numerical-linear-algebra_EQ0421 (7.3)	170	1.000	`\lambda=\frac{\boldsymbol{v}^{*} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{v}}{\boldsymbol{v}^{*} \boldsymbol{v}}=\frac{|\boldsymbol{A} \boldsymbol{v} |_{2}^{2}}{|\boldsymbol{v}|_{2}^{2}} \geq 0 .`	$\lambda=\frac{\boldsymbol{v}^{*} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{v}}{\boldsymbol{v}^{*} \boldsymbol{v}}=\frac{\|\boldsymbol{A} \boldsymbol{v} \|_{2}^{2}}{\|\boldsymbol{v}\|_{2}^{2}} \geq 0 .$	$\lambda=\frac{\boldsymbol{v}^{*} \boldsymbol{A}^{*} \boldsymbol{A} \boldsymbol{v}}{\boldsymbol{v}^{*} \boldsymbol{v}}=\frac{\|\boldsymbol{A} \boldsymbol{v} \|_{2}^{2}}{\|\boldsymbol{v}\|_{2}^{2}} \geq 0 .$
lyche-numerical-linear-algebra_EQ0423	171	1.000	`\boldsymbol{B}:=\boldsymbol{A}^{T} \boldsymbol{A}= \frac{1}{25}\left[\begin{array}{ll} 52 & 36 \\ 36 & 73 \end{array}\right]`	$\boldsymbol{B}:=\boldsymbol{A}^{T} \boldsymbol{A}= \frac{1}{25}\left[\begin{array}{ll} 52 & 36 \\ 36 & 73 \end{array}\right]$	$\boldsymbol{B}:=\boldsymbol{A}^{T} \boldsymbol{A}= \frac{1}{25}\left[\begin{array}{ll} 52 & 36 \\ 36 & 73 \end{array}\right]$
lyche-numerical-linear-algebra_EQ0424	171	1.000	`\boldsymbol{B}\left[\begin{array}{l} 3 \\ 4 \end{array} \right]=4\left[\begin{array}{l} 3 \\ 4 \end{array} \right], \quad \boldsymbol{B}\left[\begin{array}{r} 4 \\ -3 \end{array}\right]=1\left[\begin{array}{r} 4 \\ -3 \end{array}\right] .`	$\boldsymbol{B}\left[\begin{array}{l} 3 \\ 4 \end{array} \right]=4\left[\begin{array}{l} 3 \\ 4 \end{array} \right], \quad \boldsymbol{B}\left[\begin{array}{r} 4 \\ -3 \end{array}\right]=1\left[\begin{array}{r} 4 \\ -3 \end{array}\right] .$	$\boldsymbol{B}\left[\begin{array}{l} 3 \\ 4 \end{array} \right]=4\left[\begin{array}{l} 3 \\ 4 \end{array} \right], \quad \boldsymbol{B}\left[\begin{array}{r} 4 \\ -3 \end{array}\right]=1\left[\begin{array}{r} 4 \\ -3 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0428 (7.6)	172	1.000	`\boldsymbol{A}=\sum_{j=1}^{r} \sigma_{j} \boldsymbol{u}_{j} \boldsymbol{v}_{j}^{*} .`	$\boldsymbol{A}=\sum_{j=1}^{r} \sigma_{j} \boldsymbol{u}_{j} \boldsymbol{v}_{j}^{*} .$	$\boldsymbol{A}=\sum_{j=1}^{r} \sigma_{j} \boldsymbol{u}_{j} \boldsymbol{v}_{j}^{*} .$
lyche-numerical-linear-algebra_EQ0430	172	1.000	`\boldsymbol{B}:=\boldsymbol{A}^{T} \boldsymbol{A}=\left[ \begin{array}{ll} 2 & 2 \\ 2 & 2 \end{array}\right]`	$\boldsymbol{B}:=\boldsymbol{A}^{T} \boldsymbol{A}=\left[\begin{array}{ll} 2 & 2 \\ 2 & 2 \end{array}\right]$	$\boldsymbol{B}:=\boldsymbol{A}^{T} \boldsymbol{A}=\left[\begin{array}{ll} 2 & 2 \\ 2 & 2 \end{array}\right]$
lyche-numerical-linear-algebra_EQ0433	173	1.000	`\boldsymbol{A}=\frac{1}{\sqrt{2}}\left[\begin{array}{l} 1 \\ 1 \\ 0 \end{array}\right][2] \frac{1}{\sqrt{2}}\left[ \begin{array}{ll} 1 & 1 \end{array}\right] .`	$\boldsymbol{A}=\frac{1}{\sqrt{2}}\left[\begin{array}{l} 1 \\ 1 \\ 0 \end{array}\right][2] \frac{1}{\sqrt{2}}\left[\begin{array}{ll} 1 & 1 \end{array}\right] .$	$\boldsymbol{A}=\frac{1}{\sqrt{2}}\left[\begin{array}{l} 1 \\ 1 \\ 0 \end{array}\right][2] \frac{1}{\sqrt{2}}\left[\begin{array}{ll} 1 & 1 \end{array}\right] .$

Identifier	Page	Conf.	LaTeX source	Rendered	Image
lyche-numerical-linear-algebra_EQ0434	173	1.000	`\boldsymbol{s}_{1}=\left[\begin{array}{l} 1 \\ 1 \\ 0 \end{array}\right], \quad \boldsymbol{s}_{2}=\left[\begin{array}{l} 0 \\ 1 \\ 0 \end{array}\right], \quad \boldsymbol{s}_{3}=\left[\begin{array}{l} 0 \\ 0 \\ 1 \end{array}\right],`	$\boldsymbol{s}_1 = \left[\begin{array}{l} 1 \\ 1 \\ 0 \end{array}\right], \quad \boldsymbol{s}_2 = \left[\begin{array}{l} 0 \\ 1 \\ 0 \end{array}\right], \quad \boldsymbol{s}_3 = \left[\begin{array}{l} 0 \\ 0 \\ 1 \end{array}\right],$	$\boldsymbol{s}_1 = \left[\begin{array}{l} 1 \\ 1 \\ 0 \end{array}\right], \quad \boldsymbol{s}_2 = \left[\begin{array}{l} 0 \\ 1 \\ 0 \end{array}\right], \quad \boldsymbol{s}_3 = \left[\begin{array}{l} 0 \\ 0 \\ 1 \end{array}\right],$
lyche-numerical-linear-algebra_EQ0437	174	1.000	`\mathcal{E}=\boldsymbol{U}_{1} \tilde{\mathcal{E}} \text{ where } \tilde{\mathcal{E}}:=\left\{\boldsymbol{y}=\left[y_{1}, \ldots, y_{n}\right]^{T} \in \mathbb{R}^{n}: \frac{y_{1}^{2}}{\sigma_{1}^{2}}+\cdots+\frac{y_{n}^{2}}{\sigma_{n}^{2}}=1\right\} .`	$\mathcal{E}=\boldsymbol{U}_1 \tilde{\mathcal{E}} \text{ where } \tilde{\mathcal{E}}:=\left\{\boldsymbol{y}=\left[y_1, \ldots, y_n\right]^T \in \mathbb{R}^n: \frac{y_1^2}{\sigma_1^2}+\cdots+\frac{y_n^2}{\sigma_n^2}=1\right\}.$	$\mathcal{E}=\boldsymbol{U}_1 \tilde{\mathcal{E}} \text{ where } \tilde{\mathcal{E}}:=\left\{\boldsymbol{y}=\left[y_1, \ldots, y_n\right]^T \in \mathbb{R}^n: \frac{y_1^2}{\sigma_1^2}+\cdots+\frac{y_n^2}{\sigma_n^2}=1\right\}.$
lyche-numerical-linear-algebra_EQ0441 (7.9)	176	1.000	`\\|\boldsymbol{A}\\|_{F}:=\left(\sum_{i=1}^{m} \sum_{j=1}^{n}\left|a_{i j}\right|^{2}\right)^{1 / 2} .`	$\\|\boldsymbol{A}\\|_F:=\left(\sum_{i=1}^{m} \sum_{j=1}^{n}\left\|a_{i j}\right\|^2\right)^{1 / 2} .$	$\\|\boldsymbol{A}\\|_F:=\left(\sum_{i=1}^{m} \sum_{j=1}^{n}\left\|a_{i j}\right\|^2\right)^{1 / 2} .$
lyche-numerical-linear-algebra_EQ0444	177	1.000	`\left|\boldsymbol{A}-\boldsymbol{A}^{\prime}\right|_{F}=\left|\boldsymbol{U}\left[\begin{array}{c} \boldsymbol{D}-\boldsymbol{D}^{\prime} \\ \mathbf{0} \end{array}\right] \boldsymbol{V}^{*}\right|_{F}=\left|\left[\begin{array}{c} \boldsymbol{D}-\boldsymbol{D}^{\prime} \\ \mathbf{0} \end{array}\right]\right|_{F}=\sqrt{\sigma_{r+1}^{2}+\cdots+\sigma_{n}^{2}}<\epsilon .`	$\left\\|\boldsymbol{A}-\boldsymbol{A}^{\prime}\right\\|_F=\left\|\boldsymbol{U}\left[\begin{array}{c} \boldsymbol{D}-\boldsymbol{D}^{\prime} \\ \mathbf{0} \end{array}\right] \boldsymbol{V}^{*}\right\|_F=\left\|\left[\begin{array}{c} \boldsymbol{D}-\boldsymbol{D}^{\prime} \\ \mathbf{0} \end{array}\right]\right\|_F=\sqrt{\sigma_{r+1}^2+\cdots+\sigma_n^2}<\epsilon.$	$\left\\|\boldsymbol{A}-\boldsymbol{A}^{\prime}\right\\|_F=\left\|\boldsymbol{U}\left[\begin{array}{c} \boldsymbol{D}-\boldsymbol{D}^{\prime} \\ \mathbf{0} \end{array}\right] \boldsymbol{V}^{*}\right\|_F=\left\|\left[\begin{array}{c} \boldsymbol{D}-\boldsymbol{D}^{\prime} \\ \mathbf{0} \end{array}\right]\right\|_F=\sqrt{\sigma_{r+1}^2+\cdots+\sigma_n^2}<\epsilon.$
lyche-numerical-linear-algebra_EQ0449	180	1.000	`\boldsymbol{C}:=\left[\begin{array}{cc} \mathbf{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \mathbf{0} \end{array}\right] \in \mathbb{R}^{(m+n) \times(m+n)}`	$\boldsymbol{C}:=\left[\begin{array}{cc} \mathbf{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \mathbf{0} \end{array}\right] \in \mathbb{R}^{(m+n) \times(m+n)}$	$\boldsymbol{C}:=\left[\begin{array}{cc} \mathbf{0} & \boldsymbol{A} \\ \boldsymbol{A}^{*} & \mathbf{0} \end{array}\right] \in \mathbb{R}^{(m+n) \times(m+n)}$
lyche-numerical-linear-algebra_EQ0450	180	1.000	`\left\{\left(\sigma_{1}, \boldsymbol{p}_{1}\right), \ldots,\left(\sigma_{n}, \boldsymbol{p}_{n}\right), \left(-\sigma_{1}, \boldsymbol{q}_{1}\right), \ldots,\left(-\sigma_{n}, \boldsymbol{q}_{n}\right), \left(0, \boldsymbol{r}_{n+1}\right), \ldots,\left(0, \boldsymbol{r}_{m}\right)\right\},`	$\left\{\left(\sigma_1, \boldsymbol{p}_1\right), \ldots,\left(\sigma_n, \boldsymbol{p}_n\right), \left(-\sigma_1, \boldsymbol{q}_1\right), \ldots,\left(-\sigma_n, \boldsymbol{q}_n\right), \left(0, \boldsymbol{r}_{n+1}\right), \ldots,\left(0, \boldsymbol{r}_m\right)\right\},$	$\left\{\left(\sigma_1, \boldsymbol{p}_1\right), \ldots,\left(\sigma_n, \boldsymbol{p}_n\right), \left(-\sigma_1, \boldsymbol{q}_1\right), \ldots,\left(-\sigma_n, \boldsymbol{q}_n\right), \left(0, \boldsymbol{r}_{n+1}\right), \ldots,\left(0, \boldsymbol{r}_m\right)\right\},$
lyche-numerical-linear-algebra_EQ0452 (7.12)	180	1.000	`\boldsymbol{Q}:=\boldsymbol{U} \boldsymbol{V}^{T}, \quad \boldsymbol{P}:=\boldsymbol{V} \boldsymbol{\Sigma} \boldsymbol{V}^{T}`	$\boldsymbol{Q}:=\boldsymbol{U} \boldsymbol{V}^T, \quad \boldsymbol{P}:=\boldsymbol{V} \boldsymbol{\Sigma} \boldsymbol{V}^T$	$\boldsymbol{Q}:=\boldsymbol{U} \boldsymbol{V}^T, \quad \boldsymbol{P}:=\boldsymbol{V} \boldsymbol{\Sigma} \boldsymbol{V}^T$
lyche-numerical-linear-algebra_EQ0453 (7.13)	180	1.000	`A=Q P`	$A=QP$	$\boldsymbol{A}=\boldsymbol{Q} \boldsymbol{P}$
lyche-numerical-linear-algebra_EQ0455 (7.15)	181	1.000	`\boldsymbol{X}_{k+1}-\boldsymbol{Q}=\frac{1}{2} \boldsymbol{X}_{k}^{-T}\left(\boldsymbol{X}_{k}^{T}-\boldsymbol{Q}^{T}\right)\left(\boldsymbol{X}_{k}-\boldsymbol{Q}\right)`	$\boldsymbol{X}_{k+1}-\boldsymbol{Q}=\frac{1}{2} \boldsymbol{X}_k^{-T}\left(\boldsymbol{X}_k^T-\boldsymbol{Q}^T\right)\left(\boldsymbol{X}_k-\boldsymbol{Q}\right)$	$\boldsymbol{X}_{k+1}-\boldsymbol{Q}=\frac{1}{2} \boldsymbol{X}_k^{-T}\left(\boldsymbol{X}_k^T-\boldsymbol{Q}^T\right)\left(\boldsymbol{X}_k-\boldsymbol{Q}\right)$
lyche-numerical-linear-algebra_EQ0456 (7.16)	181	1.000	`\left|\boldsymbol{X}_{k+1}-\boldsymbol{Q}\right|_{F} \leq \frac{1}{2}\left|\boldsymbol{X}_{k}^{-1}\right|_{F}\left|\boldsymbol{X}_{k}-\boldsymbol{Q}\right|_{F}^{2} .`	$\left\\|\boldsymbol{X}_{k+1}-\boldsymbol{Q}\right\\|_F \leq \frac{1}{2}\left\|\boldsymbol{X}_k^{-1}\right\|_F\left\|\boldsymbol{X}_k-\boldsymbol{Q}\right\|_F^2 .$	$\left\\|\boldsymbol{X}_{k+1}-\boldsymbol{Q}\right\\|_F \leq \frac{1}{2}\left\|\boldsymbol{X}_k^{-1}\right\|_F\left\|\boldsymbol{X}_k-\boldsymbol{Q}\right\|_F^2 .$
lyche-numerical-linear-algebra_EQ0458	181	1.000	`\boldsymbol{B}=\left[\begin{array}{ccc} 1 & 0 & -1 \\ 1 & 1 & 1 \end{array}\right] .`	$\boldsymbol{B}=\left[\begin{array}{ccc} 1 & 0 & -1 \\ 1 & 1 & 1 \end{array}\right] .$	$\boldsymbol{B}=\left[\begin{array}{ccc} 1 & 0 & -1 \\ 1 & 1 & 1 \end{array}\right] .$

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lyche-numerical-linear-algebra_EQ0461	182	■1.000	`\boldsymbol{A}=\left[\begin{array}{rrrr} 1 & -1 & -1 & -1 \\ 0 & 1 & -1 & -1 \\ 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 1 \end{array}\right] .`	$\boldsymbol{A}=\left[\begin{array}{rrrr} 1 & -1 & -1 & -1 \\ 0 & 1 & -1 & -1 \\ 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 1 \end{array}\right] .$	$\boldsymbol{A}=\left[\begin{array}{rrrr} 1 & -1 & -1 & -1 \\ 0 & 1 & -1 & -1 \\ 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 1 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0464	183	■1.000	`\left|\boldsymbol{A}-\boldsymbol{A}^{\prime}\right|_{F}^{2}=\sigma_{r+1}^{2}+\cdots+\sigma_{n}^{2} .`	$\left\|\boldsymbol{A}-\boldsymbol{A}^{\prime}\right\|_{F}^{2}=\sigma_{r+1}^{2}+\cdots+\sigma_{n}^{2} .$	$\left\|\boldsymbol{A}-\boldsymbol{A}^{\prime}\right\|_{F}^{2}=\sigma_{r+1}^{2}+\cdots+\sigma_{n}^{2} .$
lyche-numerical-linear-algebra_EQ0472	187	■1.000	`\mathcal{S}:=\left\{\boldsymbol{y} \in \mathcal{V}:|\boldsymbol{y}|^{\prime}=1\right\} .`	$\mathcal{S}:=\left\{\boldsymbol{y} \in \mathcal{V}:\|\boldsymbol{y}\|^{\prime}=1\right\} .$	$\mathcal{S}:=\left\{\boldsymbol{y} \in \mathcal{V}:\|\boldsymbol{y}\|^{\prime}=1\right\} .$
lyche-numerical-linear-algebra_EQ0473 (8.8)	187	■1.000	`m \leq|\boldsymbol{y}| \leq M, \quad \boldsymbol{y} \in \mathcal{S} .`	$m \leq\|\boldsymbol{y}\| \leq M, \quad \boldsymbol{y} \in \mathcal{S} .$	$m \leq\|\boldsymbol{y}\| \leq M, \quad \boldsymbol{y} \in \mathcal{S} .$
lyche-numerical-linear-algebra_EQ0474	188	■1.000	`|\boldsymbol{A}|_{F}:=\left(\sum_{i=1}^{m} \sum_{j=1}^{n}\left|a_{i j}\right|^{2}\right)^{1 / 2}`	$\|\boldsymbol{A}\|_{F}:=\left(\sum_{i=1}^{m} \sum_{j=1}^{n}\left\|a_{i j}\right\|^{2}\right)^{1 / 2}$	$\|\boldsymbol{A}\|_{F}:=\left(\sum_{i=1}^{m} \sum_{j=1}^{n}\left\|a_{i j}\right\|^{2}\right)^{1 / 2}$
lyche-numerical-linear-algebra_EQ0475	188	■1.000	`\mu|\boldsymbol{A}| \leq|\boldsymbol{A}|^{\prime} \leq M|\boldsymbol{A}|`	$\mu\|\boldsymbol{A}\| \leq\|\boldsymbol{A}\|^{\prime} \leq M\|\boldsymbol{A}\|$	$\mu\|\boldsymbol{A}\| \leq\|\boldsymbol{A}\|^{\prime} \leq M\|\boldsymbol{A}\|$
lyche-numerical-linear-algebra_EQ0476 (8.9)	188	■1.000	`|\boldsymbol{A}|_{S}:=\sum_{i=1}^{m} \sum_{j=1}^{n} \left|a_{i j}\right|, \quad|\boldsymbol{A}|_{F}:=\left( \sum_{i=1}^{m} \sum_{j=1}^{n}\left|a_{i j}\right|^{2} \right)^{1 / 2}, \quad|\boldsymbol{A}|_{M}:=\max _{i, j}\left|a_{i j}\right| .`	$\|\boldsymbol{A}\|_{S}:=\sum_{i=1}^{m} \sum_{j=1}^{n}\left\|a_{i j}\right\|, \quad\|\boldsymbol{A}\|_{F}:=\left(\sum_{i=1}^{m} \sum_{j=1}^{n}\left\|a_{i j}\right\|^{2} \right)^{1 / 2}, \quad\|\boldsymbol{A}\|_{M}:=\max _{i, j}\left\|a_{i j}\right\| .$	$\|\boldsymbol{A}\|_{S}:=\sum_{i=1}^{m} \sum_{j=1}^{n}\left\|a_{i j}\right\|, \quad\|\boldsymbol{A}\|_{F}:=\left(\sum_{i=1}^{m} \sum_{j=1}^{n}\left\|a_{i j}\right\|^{2} \right)^{1 / 2}, \quad\|\boldsymbol{A}\|_{M}:=\max _{i, j}\left\|a_{i j}\right\| .$
lyche-numerical-linear-algebra_EQ0478 (8.11)	189	■1.000	`|\boldsymbol{A} \boldsymbol{x}| \leq|\boldsymbol{A}| |\boldsymbol{x}|,`	$\|\boldsymbol{A} \boldsymbol{x}\| \leq\|\boldsymbol{A}\| \|\boldsymbol{x}\|,$	$\|\boldsymbol{A} \boldsymbol{x}\| \leq\|\boldsymbol{A}\| \|\boldsymbol{x}\|,$
lyche-numerical-linear-algebra_EQ0479 (8.12)	190	■1.000	`|\boldsymbol{A}|:=\max _{\boldsymbol{x} \neq 0} \frac{ |\boldsymbol{A} \boldsymbol{x}|}{|\boldsymbol{x}|} .`	$\|\boldsymbol{A}\|:=\max _{\boldsymbol{x} \neq 0} \frac{ \|\boldsymbol{A} \boldsymbol{x}\|}{\|\boldsymbol{x}\|} .$	$\|\boldsymbol{A}\|:=\max _{\boldsymbol{x} \neq 0} \frac{ \|\boldsymbol{A} \boldsymbol{x}\|}{\|\boldsymbol{x}\|} .$
lyche-numerical-linear-algebra_EQ0480 (8.13)	190	■1.000	`|\boldsymbol{A}|=\max _{|\boldsymbol{x}|=1}| \boldsymbol{A} \boldsymbol{x}| .`	$\|\boldsymbol{A}\|=\max _{\|\boldsymbol{x}\|=1}\| \boldsymbol{A} \boldsymbol{x}\| .$	$\|\boldsymbol{A}\|=\max _{\|\boldsymbol{x}\|=1}\| \boldsymbol{A} \boldsymbol{x}\| .$
lyche-numerical-linear-algebra_EQ0483 (8.15)	190	■1.000	`|\boldsymbol{A} \boldsymbol{x}| \leq|\boldsymbol{A}| |\boldsymbol{x}| \text { for all } \boldsymbol{A} \in \mathbb{C}^{m \times n} \text { and } \boldsymbol{x} \in \mathbb{C}^{n} .`	$\|\boldsymbol{A} \boldsymbol{x}\| \leq\|\boldsymbol{A}\| \|\boldsymbol{x}\| \text { for all } \boldsymbol{A} \in \mathbb{C}^{m \times n} \text { and } \boldsymbol{x} \in \mathbb{C}^{n} .$	$\|\boldsymbol{A} \boldsymbol{x}\| \leq\|\boldsymbol{A}\| \|\boldsymbol{x}\| \text { for all } \boldsymbol{A} \in \mathbb{C}^{m \times n} \text { and } \boldsymbol{x} \in \mathbb{C}^{n} .$
lyche-numerical-linear-algebra_EQ0489	192	■1.000	`|\boldsymbol{A} \boldsymbol{x}|_{1}=\sum_{k=1}^{m} \left|\sum_{j=1}^{n} a_{k j} x_{j}\right| \leq \sum_{k=1}^{m} \sum_{j=1}^{n}\left|a_{k j}\right| \left|x_{j}\right|=\sum_{j=1}^{n}\left(\sum_{k=1}^{m} \left|a_{k j}\right|\right)\left|x_{j}\right| \leq K_{1} .`	$\|\boldsymbol{A} \boldsymbol{x}\|_{1}=\sum_{k=1}^{m} \left\|\sum_{j=1}^{n} a_{k j} x_{j}\right\| \leq \sum_{k=1}^{m} \sum_{j=1}^{n}\left\|a_{k j}\right\| \left\|x_{j}\right\|=\sum_{j=1}^{n}\left(\sum_{k=1}^{m} \left\|a_{k j}\right\|\right)\left\|x_{j}\right\| \leq K_{1} .$	$\|\boldsymbol{A} \boldsymbol{x}\|_{1}=\sum_{k=1}^{m} \left\|\sum_{j=1}^{n} a_{k j} x_{j}\right\| \leq \sum_{k=1}^{m} \sum_{j=1}^{n}\left\|a_{k j}\right\| \left\|x_{j}\right\|=\sum_{j=1}^{n}\left(\sum_{k=1}^{m} \left\|a_{k j}\right\|\right)\left\|x_{j}\right\| \leq K_{1} .$
lyche-numerical-linear-algebra_EQ0491	192	■1.000	`|\boldsymbol{A}|_{1}=\frac{29}{15}, \quad| \boldsymbol{A}|_{2}=2, \quad|\boldsymbol{A}|_{\infty}= \frac{37}{15}, \quad|\boldsymbol{A}|_{F}=\sqrt{5} .`	$\|\boldsymbol{A}\|_{1}=\frac{29}{15}, \quad\| \boldsymbol{A}\|_{2}=2, \quad\|\boldsymbol{A}\|_{\infty}= \frac{37}{15}, \quad\|\boldsymbol{A}\|_{F}=\sqrt{5} .$	$\|\boldsymbol{A}\|_{1}=\frac{29}{15}, \quad\| \boldsymbol{A}\|_{2}=2, \quad\|\boldsymbol{A}\|_{\infty}= \frac{37}{15}, \quad\|\boldsymbol{A}\|_{F}=\sqrt{5} .$
lyche-numerical-linear-algebra_EQ0495	194	■1.000	`|\boldsymbol{U} \boldsymbol{A}|_{2}=\max _{| \boldsymbol{x}|_{2}=1}|\boldsymbol{U} \boldsymbol{A} \boldsymbol{x}|_{2}=\max _{|\boldsymbol{x}|_{2}=1} |\boldsymbol{A} \boldsymbol{x}|_{2}=|\boldsymbol{A} \boldsymbol{x}|_{2} .`	$\|\boldsymbol{U} \boldsymbol{A}\|_{2}=\max _{\| \boldsymbol{x}\|_{2}=1}\|\boldsymbol{U} \boldsymbol{A} \boldsymbol{x}\|_{2}=\max _{\|\boldsymbol{x}\|_{2}=1} \|\boldsymbol{A} \boldsymbol{x}\|_{2}=\|\boldsymbol{A} \boldsymbol{x}\|_{2} .$	$\|\boldsymbol{U} \boldsymbol{A}\|_{2}=\max _{\| \boldsymbol{x}\|_{2}=1}\|\boldsymbol{U} \boldsymbol{A} \boldsymbol{x}\|_{2}=\max _{\|\boldsymbol{x}\|_{2}=1} \|\boldsymbol{A} \boldsymbol{x}\|_{2}=\|\boldsymbol{A} \boldsymbol{x}\|_{2} .$
lyche-numerical-linear-algebra_EQ0496	194	■1.000	`|\boldsymbol{A} \boldsymbol{V}|_{2}=\left|( \boldsymbol{A} \boldsymbol{V})^{*}\right|_{2}=\left |\boldsymbol{V}^{*} \boldsymbol{A}^{*}\right|_{2}=\left |\boldsymbol{A}^{*}\right|_{2}=|\boldsymbol{A}|_{2} .`	$\|\boldsymbol{A} \boldsymbol{V}\|_{2}=\left\|(\boldsymbol{A} \boldsymbol{V})^{*}\right\|_{2}=\left \|\boldsymbol{V}^{*} \boldsymbol{A}^{*}\right\|_{2}=\left \|\boldsymbol{A}^{*}\right\|_{2}=\|\boldsymbol{A}\|_{2} .$	$\|\boldsymbol{A} \boldsymbol{V}\|_{2}=\left\|(\boldsymbol{A} \boldsymbol{V})^{*}\right\|_{2}=\left \|\boldsymbol{V}^{*} \boldsymbol{A}^{*}\right\|_{2}=\left \|\boldsymbol{A}^{*}\right\|_{2}=\|\boldsymbol{A}\|_{2} .$

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lyche-numerical-linear-algebra_EQ0501 (8.22)	195	1.000	`\frac{1}{K(\boldsymbol{A})} \frac{\\|\boldsymbol{e}\\|}{\\|\boldsymbol{b}\\|} \leq \frac{\\|\boldsymbol{y}-\boldsymbol{x}\\|}{\\|\boldsymbol{x}\\|} \leq K(\boldsymbol{A}) \frac{\\|\boldsymbol{e}\\|}{\\|\boldsymbol{b}\\|},`	$\frac{1}{K(\boldsymbol{A})} \frac{\\|\boldsymbol{e}\\|}{\\|\boldsymbol{b}\\|} \leq \frac{\\|\boldsymbol{y}-\boldsymbol{x}\\|}{\\|\boldsymbol{x}\\|} \leq K(\boldsymbol{A}) \frac{\\|\boldsymbol{e}\\|}{\\|\boldsymbol{b}\\|},$	$\frac{1}{K(\boldsymbol{A})} \frac{\\|\boldsymbol{e}\\|}{\\|\boldsymbol{b}\\|} \leq \frac{\\|\boldsymbol{y}-\boldsymbol{x}\\|}{\\|\boldsymbol{x}\\|} \leq K(\boldsymbol{A}) \frac{\\|\boldsymbol{e}\\|}{\\|\boldsymbol{b}\\|},$
lyche-numerical-linear-algebra_EQ0503 (8.24)	196	1.000	`\begin{aligned} & \frac{\\|\boldsymbol{y}-\boldsymbol{x}\\|}{\\|\boldsymbol{y}\\|} \leq r \leq K(\boldsymbol{A}) \frac{\\|\boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|}, \\ & \frac{\\|\boldsymbol{y}-\boldsymbol{x}\\|}{\\|\boldsymbol{x}\\|} \leq \frac{r}{1-r} \leq \frac{K(\boldsymbol{A})}{1-r} \frac{\\|\boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|} . \end{aligned}`	$\begin{aligned} & \frac{\\|\boldsymbol{y}-\boldsymbol{x}\\|}{\\|\boldsymbol{y}\\|} \leq r \leq K(\boldsymbol{A}) \frac{\\|\boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|}, \\ & \frac{\\|\boldsymbol{y}-\boldsymbol{x}\\|}{\\|\boldsymbol{x}\\|} \leq \frac{r}{1-r} \leq \frac{K(\boldsymbol{A})}{1-r} \frac{\\|\boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|} . \end{aligned}$	$\begin{aligned} & \frac{\\|\boldsymbol{y}-\boldsymbol{x}\\|}{\\|\boldsymbol{y}\\|} \leq r \leq K(\boldsymbol{A}) \frac{\\|\boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|}, \\ & \frac{\\|\boldsymbol{y}-\boldsymbol{x}\\|}{\\|\boldsymbol{x}\\|} \leq \frac{r}{1-r} \leq \frac{K(\boldsymbol{A})}{1-r} \frac{\\|\boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0506 (8.28)	198	1.000	`\frac{1}{1+r} \leq \frac{\left\\|\boldsymbol{B}^{-1} \right\\|}{\left\\|\boldsymbol{A}^{-1}\right\\|} \leq \frac{1}{1-r} .`	$\frac{1}{1+r} \leq \frac{\left\\|\boldsymbol{B}^{-1} \right\\|}{\left\\|\boldsymbol{A}^{-1}\right\\|} \leq \frac{1}{1-r} .$	$\frac{1}{1+r} \leq \frac{\\|\boldsymbol{B}^{-1}\\|}{\\|\boldsymbol{A}^{-1}\\|} \leq \frac{1}{1-r} .$
lyche-numerical-linear-algebra_EQ0507 (8.29)	198	1.000	`\frac{\left\\|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1} \right\\|}{\left\\|\boldsymbol{A}^{-1}\right\\|} \leq \frac{r}{1-r} \leq \frac{K(\boldsymbol{A})}{1-r} \frac{\\| \boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|} .`	$\frac{\left\\|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1} \right\\|}{\left\\|\boldsymbol{A}^{-1}\right\\|} \leq \frac{r}{1-r} \leq \frac{K(\boldsymbol{A})}{1-r} \frac{\\|\boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|} .$	$\frac{\\|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}\\|}{\\|\boldsymbol{A}^{-1}\\|} \leq \frac{r}{1-r} \leq \frac{K(\boldsymbol{A})}{1-r} \frac{\\|\boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|} .$
lyche-numerical-linear-algebra_EQ0508 (8.30)	198	1.000	`\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}=- \boldsymbol{A}^{-1} \boldsymbol{E} \boldsymbol{B}^{-1}=- \boldsymbol{B}^{-1} \boldsymbol{E} \boldsymbol{A}^{-1} .`	$\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}=-\boldsymbol{A}^{-1} \boldsymbol{E} \boldsymbol{B}^{-1}=-\boldsymbol{B}^{-1} \boldsymbol{E} \boldsymbol{A}^{-1} .$	$\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}=-\boldsymbol{A}^{-1} \boldsymbol{E} \boldsymbol{B}^{-1}=-\boldsymbol{B}^{-1} \boldsymbol{E} \boldsymbol{A}^{-1} .$
lyche-numerical-linear-algebra_EQ0512 (8.31)	199	1.000	`f\left((1-\lambda) x_{1}+\lambda x_{2}\right) \leq(1- \lambda) f\left(x_{1}\right)+\lambda f\left(x_{2}\right)`	$f\left((1-\lambda) x_{1}+\lambda x_{2}\right) \leq(1- \lambda) f\left(x_{1}\right)+\lambda f\left(x_{2}\right)$	$f\left((1-\lambda) x_{1}+\lambda x_{2}\right) \leq(1- \lambda) f\left(x_{1}\right)+\lambda f\left(x_{2}\right)$
lyche-numerical-linear-algebra_EQ0514	200	1.000	`x=\frac{x_{2}-x}{x_{2}-x_{1}} x_{1}+ \frac{x-x_{1}}{x_{2}-x_{1}} x_{2}=(1-\lambda) x_{1}+ \lambda x_{2}`	$x=\frac{x_{2}-x}{x_{2}-x_{1}} x_{1}+ \frac{x-x_{1}}{x_{2}-x_{1}} x_{2}=(1-\lambda) x_{1}+ \lambda x_{2}$	$x=\frac{x_{2}-x}{x_{2}-x_{1}} x_{1}+ \frac{x-x_{1}}{x_{2}-x_{1}} x_{2}=(1-\lambda) x_{1}+ \lambda x_{2}$
lyche-numerical-linear-algebra_EQ0515	200	1.000	`f\left(\sum_{j=1}^{n} \lambda_{j} z_{j}\right) \leq \sum_{j=1}^{n} \lambda_{j} f\left(z_{j}\right) .`	$f\left(\sum_{j=1}^{n} \lambda_{j} z_{j}\right) \leq \sum_{j=1}^{n} \lambda_{j} f\left(z_{j}\right) .$	$f\left(\sum_{j=1}^{n} \lambda_{j} z_{j}\right) \leq \sum_{j=1}^{n} \lambda_{j} f\left(z_{j}\right) .$
lyche-numerical-linear-algebra_EQ0516	200	1.000	`f\left(\sum_{j=1}^{n} \lambda_{j} z_{j}\right)=f\left( \lambda_{1} z_{1}+\left(1-\lambda_{1}\right) u\right) \leq \lambda_{1} f\left(z_{1}\right)+\left(1-\lambda_{1} \right) f(u) \leq \sum_{j=1}^{n} \lambda_{j} f\left(z_{j} \right)`	$f\left(\sum_{j=1}^{n} \lambda_{j} z_{j}\right)=f\left(\lambda_{1} z_{1}+\left(1-\lambda_{1}\right) u\right) \leq \lambda_{1} f\left(z_{1}\right)+\left(1-\lambda_{1} \right) f(u) \leq \sum_{j=1}^{n} \lambda_{j} f\left(z_{j} \right)$	$f\left(\sum_{j=1}^{n} \lambda_{j} z_{j}\right)=f\left(\lambda_{1} z_{1}+\left(1-\lambda_{1}\right) u\right) \leq \lambda_{1} f\left(z_{1}\right)+\left(1-\lambda_{1} \right) f(u) \leq \sum_{j=1}^{n} \lambda_{j} f\left(z_{j} \right)$
lyche-numerical-linear-algebra_EQ0518	201	1.000	`-\log \left(\sum_{j=1}^{n} \lambda_{j} a_{j}\right) \leq-\sum_{j=1}^{n} \lambda_{j} \log \left(a_{j}\right)=- \log \left(a_{1}^{\lambda_{1}} \cdots a_{n}^{\lambda_{n}} \right)`	$-\log \left(\sum_{j=1}^{n} \lambda_{j} a_{j}\right) \leq-\sum_{j=1}^{n} \lambda_{j} \log \left(a_{j}\right)=- \log \left(a_{1}^{\lambda_{1}} \cdots a_{n}^{\lambda_{n}} \right)$	$-\log \left(\sum_{j=1}^{n} \lambda_{j} a_{j}\right) \leq-\sum_{j=1}^{n} \lambda_{j} \log \left(a_{j}\right)=- \log \left(a_{1}^{\lambda_{1}} \cdots a_{n}^{\lambda_{n}} \right)$
lyche-numerical-linear-algebra_EQ0519 (8.33)	201	1.000	`\left(a_{1} a_{2} \cdots a_{n}\right)^{\frac{1}{n}} \leq \frac{1}{n} \sum_{j=1}^{n} a_{j} .`	$\left(a_{1} a_{2} \cdots a_{n}\right)^{\frac{1}{n}} \leq \frac{1}{n} \sum_{j=1}^{n} a_{j} .$	$\left(a_{1} a_{2} \cdots a_{n}\right)^{\frac{1}{n}} \leq \frac{1}{n} \sum_{j=1}^{n} a_{j} .$

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lyche-numerical-linear-algebra_EQ0520	201	■ 1.000	`\sum_{j=1}^{n}\left|x_{j} y_{j}\right| \leq\\ \boldsymbol{x}\\_{p}\\\|\boldsymbol{y}\\_{q}, \text { where } \frac{1}{p}+\frac{1}{q}=1`	$\sum_{j=1}^{n}\left\|x_{j} y_{j}\right\| \leq\\ \boldsymbol{x}_{p}\\\|\boldsymbol{y}_{q}, \text { where } \frac{1}{p}+\frac{1}{q}=1$	$\sum_{j=1}^{n}\left\|x_{j} y_{j}\right\| \leq\\ \boldsymbol{x}_{p}\\\|\boldsymbol{y}_{q}, \text { where } \frac{1}{p}+\frac{1}{q}=1.$
lyche-numerical-linear-algebra_EQ0522	201	■ 1.000	`\frac{1}{\\\|\boldsymbol{x}_{p}\\\|\boldsymbol{y}_{q}} \sum_{j=1}^{n}\left|x_{j} y_{j}\right|=\sum_{j=1}^{n} \left(\frac{\left|x_{j}\right|^{p}}{\\\|\boldsymbol{x} _{p}^{p}}\right)^{\frac{1}{p}}\left(\frac{\left|y_{j} \right|^{q}}{\\\|\boldsymbol{y}_{q}^{q}}\right)^{ \frac{1}{q}} \leq \sum_{j=1}^{n}\left(\frac{1}{p} \frac{\left|x_{j}\right|^{p}}{\\\|\boldsymbol{x} _{p}^{p}}+\frac{1}{q} \frac{\left|y_{j}\right|^{q}}{\\\| \boldsymbol{y}_{q}^{q}}\right)=1`	$\frac{1}{\\\|\boldsymbol{x}_{p}\\\|\boldsymbol{y}_{q}} \sum_{j=1}^{n}\left\|x_{j} y_{j}\right\|=\sum_{j=1}^{n} \left(\frac{\left\|x_{j}\right\|^{p}}{\\\|\boldsymbol{x} _{p}^{p}}\right)^{\frac{1}{p}}\left(\frac{\left\|y_{j} \right\|^{q}}{\\\|\boldsymbol{y}_{q}^{q}}\right)^{ \frac{1}{q}} \leq \sum_{j=1}^{n}\left(\frac{1}{p} \frac{\left\|x_{j}\right\|^{p}}{\\\|\boldsymbol{x} _{p}^{p}}+\frac{1}{q} \frac{\left\|y_{j}\right\|^{q}}{\\\| \boldsymbol{y}_{q}^{q}}\right)=1$	$\frac{1}{\\\|\boldsymbol{x}_{p}\\\|\boldsymbol{y}_{q}} \sum_{j=1}^{n}\left\|x_{j} y_{j}\right\|=\sum_{j=1}^{n}\left(\frac{\left\|x_{j}\right\|^{p}}{\\\|\boldsymbol{x}_{p}^{p}}\right)^{\frac{1}{p}}\left(\frac{\left\|y_{j}\right\|^{q}}{\\\|\boldsymbol{y}_{q}^{q}}\right)^{\frac{1}{q}} \leq \sum_{j=1}^{n}\left(\frac{1}{p} \frac{\left\|x_{j}\right\|^{p}}{\\\|\boldsymbol{x}_{p}^{p}}+\frac{1}{q} \frac{\left\|y_{j}\right\|^{q}}{\\\|\boldsymbol{y}_{q}^{q}}\right)=1$
lyche-numerical-linear-algebra_EQ0523	202	■ 1.000	`\\\|\boldsymbol{x}+\boldsymbol{y}\\_{p} \leq\\ \boldsymbol{x}\\_{p}+\\\|\boldsymbol{y}\\_{p} .`	$\\\|\boldsymbol{x}+\boldsymbol{y}_{p} \leq\\ \boldsymbol{x}_{p}+\\\|\boldsymbol{y}_{p} .$	$\\\|\boldsymbol{x}+\boldsymbol{y}_{p} \leq\\ \boldsymbol{x}_{p}+\\\|\boldsymbol{y}_{p} .$
lyche-numerical-linear-algebra_EQ0524	202	■ 1.000	`\\\|\boldsymbol{x}+\boldsymbol{y}\\_{p}^{p}=\sum_{j=1}^{n} \left|x_{j}+y_{j}\right|^{p} \leq \sum_{j=1}^{n} \left|x_{j}\right|\left|x_{j}+y_{j}\right|^{p-1}+ \sum_{j=1}^{n}\left|y_{j}\right|\left|x_{j}+y_{j} \right|^{p-1} .`	$\\\|\boldsymbol{x}+\boldsymbol{y}_{p}^{p}=\sum_{j=1}^{n} \left\|x_{j}+y_{j}\right\|^{p} \leq \sum_{j=1}^{n} \left\|x_{j}\right\|\left\|x_{j}+y_{j}\right\|^{p-1}+ \sum_{j=1}^{n}\left\|y_{j}\right\|\left\|x_{j}+y_{j} \right\|^{p-1} .$	$\\\|\boldsymbol{x}+\boldsymbol{y}_{p}^{p}=\sum_{j=1}^{n}\left\|x_{j}+y_{j}\right\|^{p} \leq \sum_{j=1}^{n}\left\|x_{j}\right\|\left\|x_{j}+y_{j}\right\|^{p-1}+\sum_{j=1}^{n}\left\|y_{j}\right\|\left\|x_{j}+y_{j}\right\|^{p-1}.$
lyche-numerical-linear-algebra_EQ0525	202	■ 1.000	`\\\|\boldsymbol{x}+\boldsymbol{y}_{p}^{p} \leq\\ \boldsymbol{x}_{p}\\\|\boldsymbol{x}+\boldsymbol{y} _{p}^{p / q}+\\\|\boldsymbol{y}_{p}\\\|\boldsymbol{x}+ \boldsymbol{y}_{p}^{p / q}=\left(\\\|\boldsymbol{x} _{p}+\\\|\boldsymbol{y}_{p}\right)\\\|\boldsymbol{x}+ \boldsymbol{y}_{p}^{p-1},`	$\\\|\boldsymbol{x}+\boldsymbol{y}_{p}^{p} \leq\\ \boldsymbol{x}_{p}\\\|\boldsymbol{x}+\boldsymbol{y} _{p}^{p / q}+\\\|\boldsymbol{y}_{p}\\\|\boldsymbol{x}+ \boldsymbol{y}_{p}^{p / q}=\left(\\\|\boldsymbol{x} _{p}+\\\|\boldsymbol{y}_{p}\right)\\\|\boldsymbol{x}+ \boldsymbol{y}_{p}^{p-1},$	$\\\|\boldsymbol{x}+\boldsymbol{y}_{p}^{p} \leq\\ \boldsymbol{x}_{p}\\\|\boldsymbol{x}+\boldsymbol{y}_{p}^{p / q}+\\\|\boldsymbol{y}_{p}\\\|\boldsymbol{x}+\boldsymbol{y}_{p}^{p / q}=\left(\\\|\boldsymbol{x}_{p}+\\\|\boldsymbol{y}_{p}\right)\\\|\boldsymbol{x}+\boldsymbol{y}_{p}^{p-1},$
lyche-numerical-linear-algebra_EQ0526 (8.35)	202	■ 1.000	`\\\|\boldsymbol{x}+\boldsymbol{y}\\\|^{2}+\\\|\boldsymbol{x}- \boldsymbol{y}\\\|^{2}=2\\\|\boldsymbol{x}\\\|^{2}+2\\\| \boldsymbol{y}\\\|^{2},`	$\\\|\boldsymbol{x}+\boldsymbol{y}\\\|^{2}+\\\|\boldsymbol{x}- \boldsymbol{y}\\\|^{2}=2\\\|\boldsymbol{x}\\\|^{2}+2\\\| \boldsymbol{y}\\\|^{2},$	$\\\|\boldsymbol{x}+\boldsymbol{y}\\\|^{2}+\\\|\boldsymbol{x}-\boldsymbol{y}\\\|^{2}=2\\\|\boldsymbol{x}\\\|^{2}+2\\\|\boldsymbol{y}\\\|^{2},$
lyche-numerical-linear-algebra_EQ0534	203	■ 1.000	`\left\langle\frac{n}{m} \boldsymbol{x}, \boldsymbol{y} \right\rangle=\frac{n}{m}\langle\boldsymbol{x}, \boldsymbol{y}\rangle .`	$\left\langle\frac{n}{m} \boldsymbol{x}, \boldsymbol{y} \right\rangle=\frac{n}{m}\langle\boldsymbol{x}, \boldsymbol{y}\rangle .$	$\langle\frac{n}{m} \boldsymbol{x}, \boldsymbol{y}\rangle=\frac{n}{m}\langle\boldsymbol{x}, \boldsymbol{y}\rangle .$
lyche-numerical-linear-algebra_EQ0539	204	■ 1.000	`\tilde{\boldsymbol{b}}_{k}:=\boldsymbol{b}_{k}- \boldsymbol{B}_{k-1}\left(\boldsymbol{B}_{k-1}^{T} \boldsymbol{A} \boldsymbol{B}_{k-1}\right)^{-1} \boldsymbol{B}_{k-1}^{T} \boldsymbol{A} \boldsymbol{b}_{k}, \quad k=2, \ldots, n .`	$\tilde{\boldsymbol{b}}_{k}:=\boldsymbol{b}_{k}-\boldsymbol{B}_{k-1}\left(\boldsymbol{B}_{k-1}^{T} \boldsymbol{A} \boldsymbol{B}_{k-1}\right)^{-1} \boldsymbol{B}_{k-1}^{T} \boldsymbol{A} \boldsymbol{b}_{k}, \quad k=2, \ldots, n .$	$\tilde{\boldsymbol{b}}_{k}:=\boldsymbol{b}_{k}-\boldsymbol{B}_{k-1}\left(\boldsymbol{B}_{k-1}^{T} \boldsymbol{A} \boldsymbol{B}_{k-1}\right)^{-1} \boldsymbol{B}_{k-1}^{T} \boldsymbol{A} \boldsymbol{b}_{k}, \quad k=2, \ldots, n .$
lyche-numerical-linear-algebra_EQ0540	205	■ 1.000	`\left|\boldsymbol{b}_{1}\right|_{\boldsymbol{A}}\left |\boldsymbol{b}_{2}\right|_{\boldsymbol{A}} \cdots \left|\boldsymbol{b}_{n}\right|_{\boldsymbol{A}} \leq 2^{n(n-1) / 4} \sqrt{\operatorname{det}(\boldsymbol{A})} .`	$\left\|\boldsymbol{b}_{1}\right\|_{\boldsymbol{A}}\left\|\boldsymbol{b}_{2}\right\|_{\boldsymbol{A}} \cdots \left\|\boldsymbol{b}_{n}\right\|_{\boldsymbol{A}} \leq 2^{n(n-1) / 4} \sqrt{\operatorname{det}(\boldsymbol{A})} .$	$\left\|\boldsymbol{b}_{1}\right\|_{\boldsymbol{A}}\left\|\boldsymbol{b}_{2}\right\|_{\boldsymbol{A}} \cdots \left\|\boldsymbol{b}_{n}\right\|_{\boldsymbol{A}} \leq 2^{n(n-1) / 4} \sqrt{\operatorname{det}(\boldsymbol{A})} .$
lyche-numerical-linear-algebra_EQ0541	205	■ 1.000	`\\\|\boldsymbol{A}\\\|:=\sqrt{m n}\\\|\boldsymbol{A}\\\|_{M}, \quad \boldsymbol{A} \in \mathbb{C}^{m \times n}`	$\\\|\boldsymbol{A}\\\|:=\sqrt{m n}\\\|\boldsymbol{A}\\\|_{M}, \quad \boldsymbol{A} \in \mathbb{C}^{m \times n}$	$\\\|\boldsymbol{A}\\\|:=\sqrt{m n}\\\|\boldsymbol{A}\\\|_{M}, \quad \boldsymbol{A} \in \mathbb{C}^{m \times n}$
lyche-numerical-linear-algebra_EQ0542	205	■ 1.000	`\\\|\boldsymbol{A}\\\|_{2}=\max _{\\\|\boldsymbol{x}\\\|_{2}= \\\|\boldsymbol{y}\\\|_{2}=1}\left|\boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{x}\right| .`	$\\\|\boldsymbol{A}\\\|_{2}=\max _{\\\|\boldsymbol{x}\\\|_{2}= \\\|\boldsymbol{y}\\\|_{2}=1}\left\|\boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{x}\right\| .$	$\\\|\boldsymbol{A}\\\|_{2}=\max _{\\\|\boldsymbol{x}\\\|_{2}=\\\|\boldsymbol{y}\\\|_{2}=1}\left\|\boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{x}\right\| .$

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lyche-numerical-linear-algebra_EQ0545	207	1.000	`\boldsymbol{x}_{k+1}=\boldsymbol{x}_{k}+\frac{1}{ \lambda_{k+1}} \boldsymbol{r}_{k}, \text { where } \boldsymbol{r}_{k}=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k} .`	$\boldsymbol{x}_{k+1}=\boldsymbol{x}_{k}+\frac{1}{\lambda_{k+1}} \boldsymbol{r}_{k}, \text { where } \boldsymbol{r}_{k}=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k} .$	$\boldsymbol{x}_{k+1}=\boldsymbol{x}_{k}+\frac{1}{\lambda_{k+1}} \boldsymbol{r}_{k}, \text { where } \boldsymbol{r}_{k}=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k} .$
lyche-numerical-linear-algebra_EQ0546	207	1.000	`\boldsymbol{r}_{k}=\sum_{i=1}^{n} c_{i k} \boldsymbol{u}_{i},`	$\boldsymbol{r}_{k}=\sum_{i=1}^{n} c_{i k} \boldsymbol{u}_{i},$	$\boldsymbol{r}_{k}=\sum_{i=1}^{n} c_{i k} \boldsymbol{u}_{i},$
lyche-numerical-linear-algebra_EQ0548	207	1.000	`\lambda_{j}=d+2 c \cos \left(\frac{j \pi}{n+1}\right), \quad j=1, \ldots, n .`	$\lambda_{j}=d+2 c \cos \left(\frac{j \pi}{n+1}\right), \quad j=1, \ldots, n .$	$\lambda_{j}=d+2 c \cos \left(\frac{j \pi}{n+1}\right), \quad j=1, \ldots, n .$
lyche-numerical-linear-algebra_EQ0549 (8.40)	207	1.000	`\boldsymbol{T} \boldsymbol{x}_{k+1}=\boldsymbol{b}-\boldsymbol{B} \boldsymbol{x}_{k} .`	$\boldsymbol{T} \boldsymbol{x}_{k+1}=\boldsymbol{b}-\boldsymbol{B} \boldsymbol{x}_{k} .$	$\boldsymbol{T} \boldsymbol{x}_{k+1}=\boldsymbol{b}-\boldsymbol{B} \boldsymbol{x}_{k} .$
lyche-numerical-linear-algebra_EQ0550	207	1.000	`\min \left\{\max _{i} \sum_{j=1}^{n}\left|b_{i j}\right|, \max _{j} \sum_{i=1}^{n}\left|b_{i j}\right|\right\}<d-2 c .`	$\min \left\{\max _{i} \sum_{j=1}^{n}\left\|b_{i j}\right\|, \max _{j} \sum_{i=1}^{n}\left\|b_{i j}\right\|\right\}<d-2 c .$	$\min \left\{\max _{i} \sum_{j=1}^{n}\left\|b_{i j}\right\|, \max _{j} \sum_{i=1}^{n}\left\|b_{i j}\right\|\right\}<d-2 c .$
lyche-numerical-linear-algebra_EQ0552 (8.41)	208	1.000	`\frac{4}{\pi^{2}}(m+1)^{2}-2 / 3<\operatorname{cond}_{p}( \boldsymbol{T}) \leq \frac{1}{2}(m+1)^{2}, \quad p=1,2, \infty,`	$\frac{4}{\pi^{2}}(m+1)^{2}-2 / 3<\operatorname{cond}_{p}(\boldsymbol{T}) \leq \frac{1}{2}(m+1)^{2}, \quad p=1,2, \infty,$	$\frac{4}{\pi^{2}}(m+1)^{2}-2 / 3<\operatorname{cond}_{p}(\boldsymbol{T}) \leq \frac{1}{2}(m+1)^{2}, \quad p=1,2, \infty,$
lyche-numerical-linear-algebra_EQ0554	208	1.000	`\operatorname{cond}_{2}(\boldsymbol{T})=\cot ^{2}\left( \frac{\pi h}{2}\right)=1 / \tan ^{2}\left(\frac{\pi h}{2} \right) .`	$\operatorname{cond}_{2}(\boldsymbol{T})=\cot ^{2}\left(\frac{\pi h}{2}\right)=1 / \tan ^{2}\left(\frac{\pi h}{2}\right) .$	$\operatorname{cond}_{2}(\boldsymbol{T})=\cot ^{2}\left(\frac{\pi h}{2}\right)=1 / \tan ^{2}\left(\frac{\pi h}{2}\right) .$
lyche-numerical-linear-algebra_EQ0555 (8.43)	209	1.000	`\frac{4}{\pi^{2}} h^{-2}-\frac{2}{3}< \operatorname{cond}_{2}(\boldsymbol{T})<\frac{4}{\pi^{2}} h^{-2} .`	$\frac{4}{\pi^{2}} h^{-2}-\frac{2}{3}<\operatorname{cond}_{2}(\boldsymbol{T})<\frac{4}{\pi^{2}} h^{-2} .$	$\frac{4}{\pi^{2}} h^{-2}-\frac{2}{3}<\operatorname{cond}_{2}(\boldsymbol{T})<\frac{4}{\pi^{2}} h^{-2} .$
lyche-numerical-linear-algebra_EQ0556	209	1.000	`\frac{\left\\|(\boldsymbol{I}-\boldsymbol{E})^{-1}- \boldsymbol{I}\right\\|}{\left\\|(\boldsymbol{I}- \boldsymbol{E})^{-1}\right\\|} \leq\\|\boldsymbol{E}\\|`	$\frac{\left\\|(\boldsymbol{I}-\boldsymbol{E})^{-1}-\boldsymbol{I}\right\\|}{\left\\|(\boldsymbol{I}-\boldsymbol{E})^{-1}\right\\|} \leq\\|\boldsymbol{E}\\|$	$\frac{\left\\|(\boldsymbol{I}-\boldsymbol{E})^{-1}-\boldsymbol{I}\right\\|}{\left\\|(\boldsymbol{I}-\boldsymbol{E})^{-1}\right\\|} \leq\\|\boldsymbol{E}\\|$
lyche-numerical-linear-algebra_EQ0557	209	1.000	`\frac{1}{1+\\|\boldsymbol{E}\\|} \leq\left\\|( \boldsymbol{I}-\boldsymbol{E})^{-1}\right\\| \leq \frac{1}{1-\\|\boldsymbol{E}\\|}`	$\frac{1}{1+\\|\boldsymbol{E}\\|} \leq\left\\|(\boldsymbol{I}-\boldsymbol{E})^{-1}\right\\| \leq \frac{1}{1-\\|\boldsymbol{E}\\|}$	$\frac{1}{1+\\|\boldsymbol{E}\\|} \leq\left\\|(\boldsymbol{I}-\boldsymbol{E})^{-1}\right\\| \leq \frac{1}{1-\\|\boldsymbol{E}\\|}$
lyche-numerical-linear-algebra_EQ0558	209	1.000	`\left\\|(\boldsymbol{I}-\boldsymbol{E})^{-1}- \boldsymbol{I}\right\\| \leq \frac{\\|\boldsymbol{E}\\|}{1- \\|\boldsymbol{E}\\|} .`	$\left\\|(\boldsymbol{I}-\boldsymbol{E})^{-1}-\boldsymbol{I}\right\\| \leq \frac{\\|\boldsymbol{E}\\|}{1-\\|\boldsymbol{E}\\|} .$	$\left\\|(\boldsymbol{I}-\boldsymbol{E})^{-1}-\boldsymbol{I}\right\\| \leq \frac{\\|\boldsymbol{E}\\|}{1-\\|\boldsymbol{E}\\|} .$
lyche-numerical-linear-algebra_EQ0560	209	1.000	`\frac{K(\boldsymbol{B})^{-1}}{1+r} \frac{\\| \boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|} \leq \frac{\left\\| \boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}\right\\|}{\left\\| \boldsymbol{A}^{-1}\right\\|} .`	$\frac{K(\boldsymbol{B})^{-1}}{1+r} \frac{\\|\boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|} \leq \frac{\left\\|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}\right\\|}{\left\\|\boldsymbol{A}^{-1}\right\\|} .$	$\frac{K(\boldsymbol{B})^{-1}}{1+r} \frac{\\|\boldsymbol{E}\\|}{\\|\boldsymbol{A}\\|} \leq \frac{\left\\|\boldsymbol{B}^{-1}-\boldsymbol{A}^{-1}\right\\|}{\left\\|\boldsymbol{A}^{-1}\right\\|} .$
lyche-numerical-linear-algebra_EQ0561	209	1.000	`a=x_{0}<x_{1}<\cdots<x_{n}=b,`	$a=x_{0}<x_{1}<\cdots<x_{n}=b,$	$a=x_{0}<x_{1}<\cdots<x_{n}=b,$
lyche-numerical-linear-algebra_EQ0562	210	1.000	`\begin{array}{ll} g\left(x_{i}\right)=y_{i}, & i=0,1, \ldots, n, \\ g^{\prime}(a)=g^{\prime}(b), & g^{\prime \prime}(a)=g^{\prime \prime}(b) . \end{array}`	$\begin{array}{ll} g\left(x_{i}\right)=y_{i}, & i=0,1, \ldots, n, \\ g^{\prime}(a)=g^{\prime}(b), & g^{\prime \prime}(a)=g^{\prime \prime}(b) . \end{array}$	$\begin{array}{ll} g\left(x_{i}\right)=y_{i}, & i=0,1, \ldots, n, \\ g^{\prime}(a)=g^{\prime}(b), & g^{\prime \prime}(a)=g^{\prime \prime}(b) . \end{array}$

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lyche-numerical-linear-algebra_EQ0565	210	1.000	`\lambda_{i}:=\frac{h_{i}}{h_{i-1}+h_{i}}, \quad \mu_{i}:=\frac{h_{i-1}}{h_{i-1}+h_{i}}, \quad, i=1, \ldots, n,`	$\lambda_i := \frac{h_i}{h_{i-1}+h_i}, \quad \mu_i := \frac{h_{i-1}}{h_{i-1}+h_i}, \quad, i=1, \ldots, n,$	$\lambda_i := \frac{h_i}{h_{i-1}+h_i}, \quad \mu_i := \frac{h_{i-1}}{h_{i-1}+h_i}, \quad, i=1, \ldots, n,$
lyche-numerical-linear-algebra_EQ0566	210	1.000	`h_{i}=x_{i+1}-x_{i}, \quad i=0, \ldots, n-1, \text { and } h_{n}=h_{0} .`	$h_i = x_{i+1} - x_i, \quad i=0, \ldots, n-1, \text{ and } h_n = h_0.$	$h_i = x_{i+1} - x_i, \quad i=0, \ldots, n-1, \text{ and } h_n = h_0.$
lyche-numerical-linear-algebra_EQ0567	210	1.000	`\frac{1}{2} \leq \frac{h_{i}}{h_{i-1}} \leq 2, \quad i=1, \ldots, n .`	$\frac{1}{2} \leq \frac{h_i}{h_{i-1}} \leq 2, \quad i=1, \ldots, n.$	$\frac{1}{2} \leq \frac{h_i}{h_{i-1}} \leq 2, \quad i=1, \ldots, n.$
lyche-numerical-linear-algebra_EQ0568	211	1.000	`\\|\boldsymbol{A}\\|_{\infty}=3 \quad \text { and that } \quad\\|\boldsymbol{A}\\|_{1} \leq \frac{10}{3} .`	$\\|\boldsymbol{A}\\|_{\infty} = 3 \quad \text{ and that } \quad \\|\boldsymbol{A}\\|_1 \leq \frac{10}{3}.$	$\\|\boldsymbol{A}\\|_{\infty} = 3 \quad \text{ and that } \quad \\|\boldsymbol{A}\\|_1 \leq \frac{10}{3}.$
lyche-numerical-linear-algebra_EQ0571 (8.45)	211	1.000	`\langle\boldsymbol{x}, \boldsymbol{y}\rangle:=\frac{1}{4}\left(\\|\boldsymbol{x}+\boldsymbol{y}\\|^{2}-\\|\boldsymbol{x}-\boldsymbol{y}\\|^{2}+i\\|\boldsymbol{x}+i\boldsymbol{y}\\|^{2}-i\\|\boldsymbol{x}-i \boldsymbol{y}\\|^{2}\right),`	$\langle \boldsymbol{x}, \boldsymbol{y}\rangle := \frac{1}{4}\left(\\|\boldsymbol{x}+\boldsymbol{y}\\|^2 - \\|\boldsymbol{x}-\boldsymbol{y}\\|^2 + i\\|\boldsymbol{x}+i\boldsymbol{y}\\|^2 - i\\|\boldsymbol{x}-i\boldsymbol{y}\\|^2\right),$	$\langle \boldsymbol{x}, \boldsymbol{y}\rangle := \frac{1}{4}\left(\\|\boldsymbol{x}+\boldsymbol{y}\\|^2 - \\|\boldsymbol{x}-\boldsymbol{y}\\|^2 + i\\|\boldsymbol{x}+i\boldsymbol{y}\\|^2 - i\\|\boldsymbol{x}-i\boldsymbol{y}\\|^2\right),$
lyche-numerical-linear-algebra_EQ0574	213	1.000	`E(\boldsymbol{x}):=\\|\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b}\\|_{2}^{2},`	$E(\boldsymbol{x}) := \\|\boldsymbol{A}\boldsymbol{x}-\boldsymbol{b}\\|_2^2,$	$E(\boldsymbol{x}) := \\|\boldsymbol{A}\boldsymbol{x}-\boldsymbol{b}\\|_2^2,$
lyche-numerical-linear-algebra_EQ0576	214	1.000	`\\|\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b}\\|_{2}^{2}=\left(x_{1}-1\right)^{2}+\left(x_{1}-1\right)^{2}+\left(x_{1}-2\right)^{2}=3 x_{1}^{2}-8 x_{1}+6 .`	$\\|\boldsymbol{A}\boldsymbol{x}-\boldsymbol{b}\\|_2^2 = (x_1-1)^2 + (x_1-1)^2 + (x_1-2)^2 = 3x_1^2 - 8x_1 + 6.$	$\\|\boldsymbol{A}\boldsymbol{x}-\boldsymbol{b}\\|_2^2 = (x_1-1)^2 + (x_1-1)^2 + (x_1-2)^2 = 3x_1^2 - 8x_1 + 6.$
lyche-numerical-linear-algebra_EQ0581	215	1.000	`y=\boldsymbol{u}^{*} \boldsymbol{x}=\sum_{i=1}^{n} u_{i} x_{i},`	$y = \boldsymbol{u}^*\boldsymbol{x} = \sum_{i=1}^{n} u_i x_i,$	$y = \boldsymbol{u}^*\boldsymbol{x} = \sum_{i=1}^{n} u_i x_i,$
lyche-numerical-linear-algebra_EQ0585 (9.2)	216	1.000	`E(\boldsymbol{x}):=\\|\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b}\\|_{2}^{2}=\sum_{k=1}^{m}\left(\sum_{j=1}^{n} x_{j} \phi_{j}\left(t_{k}\right)-y_{k}\right)^{2} .`	$E(\boldsymbol{x}) := \\|\boldsymbol{A}\boldsymbol{x}-\boldsymbol{b}\\|_2^2 = \sum_{k=1}^{m}\left(\sum_{j=1}^{n} x_j \phi_j(t_k) - y_k\right)^2.$	$E(\boldsymbol{x}) := \\|\boldsymbol{A}\boldsymbol{x}-\boldsymbol{b}\\|_2^2 = \sum_{k=1}^{m}\left(\sum_{j=1}^{n} x_j \phi_j(t_k) - y_k\right)^2.$
lyche-numerical-linear-algebra_EQ0586	217	1.000	`E(\boldsymbol{x}):=\sum_{k=1}^{m} w_{k}\left(\sum_{j=1}^{n} x_{j} \phi_{j}\left(t_{k}\right)-y_{k}\right)^{2} .`	$E(\boldsymbol{x}) := \sum_{k=1}^{m} w_k\left(\sum_{j=1}^{n} x_j \phi_j(t_k) - y_k\right)^2.$	$E(\boldsymbol{x}) := \sum_{k=1}^{m} w_k\left(\sum_{j=1}^{n} x_j \phi_j(t_k) - y_k\right)^2.$
lyche-numerical-linear-algebra_EQ0587 (9.3)	217	1.000	`p\left(t_{k}\right):=\sum_{j=1}^{n} x_{j} \phi_{j}\left(t_{k}\right)=0, \quad k=1, \ldots, m \Rightarrow x_{1}=\cdots=x_{n}=0 .`	$p(t_k) := \sum_{j=1}^{n} x_j \phi_j(t_k) = 0, \quad k=1, \ldots, m \Rightarrow x_1 = \cdots = x_n = 0.$	$p(t_k) := \sum_{j=1}^{n} x_j \phi_j(t_k) = 0, \quad k=1, \ldots, m \Rightarrow x_1 = \cdots = x_n = 0.$
lyche-numerical-linear-algebra_EQ0595	219	1.000	`\left(\boldsymbol{A}^{*} \boldsymbol{b}\right)_{i}=\sum_{k=1}^{m} \bar{a}_{k, i} b_{k}, i=1, \ldots, n,`	$(\boldsymbol{A}^*\boldsymbol{b})_i = \sum_{k=1}^{m} \bar{a}_{k,i} b_k, i=1, \ldots, n,$	$(\boldsymbol{A}^*\boldsymbol{b})_i = \sum_{k=1}^{m} \bar{a}_{k,i} b_k, i=1, \ldots, n,$
lyche-numerical-linear-algebra_EQ0596 (9.6)	220	1.000	`K_{2}\left(\boldsymbol{A}^{*} \boldsymbol{A}\right):=\left\\|\boldsymbol{A}^{*} \boldsymbol{A}\right\\|_{2}\left\\|\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1}\right\\|_{2}=\frac{\lambda_{1}}{\lambda_{n}}=\frac{\sigma_{1}^{2}}{\sigma_{n}^{2}}=K_{2}(\boldsymbol{A})^{2},`	$K_2(\boldsymbol{A}^*\boldsymbol{A}) := \\|\boldsymbol{A}^*\boldsymbol{A}\\|_2 \left\\|(\boldsymbol{A}^*\boldsymbol{A})^{-1}\right\\|_2 = \frac{\lambda_1}{\lambda_n} = \frac{\sigma_1^2}{\sigma_n^2} = K_2(\boldsymbol{A})^2,$	$K_2(\boldsymbol{A}^*\boldsymbol{A}) := \\|\boldsymbol{A}^*\boldsymbol{A}\\|_2 \\|(\boldsymbol{A}^*\boldsymbol{A})^{-1}\\|_2 = \frac{\lambda_1}{\lambda_n} = \frac{\sigma_1^2}{\sigma_n^2} = K_2(\boldsymbol{A})^2,$

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lyche-numerical-linear-algebra_EQ0597	220	1.000	\boldsymbol{A}^{*} \boldsymbol{A}=\boldsymbol{R}_{1}^{*} \boldsymbol{Q}_{1}^{*} \boldsymbol{Q}_{1} \boldsymbol{R}_{1}=\boldsymbol{R}_{1}^{*} \boldsymbol{R}_{1}, \quad \boldsymbol{A}^{*} \boldsymbol{b}=\boldsymbol{R}_{1}^{*} \boldsymbol{Q}_{1}^{*} \boldsymbol{b} .	$\boldsymbol{A}^{*} \boldsymbol{A}=\boldsymbol{R}_{1}^{*} \boldsymbol{Q}_{1}^{*} \boldsymbol{Q}_{1} \boldsymbol{R}_{1}=\boldsymbol{R}_{1}^{*} \boldsymbol{R}_{1}, \quad \boldsymbol{A}^{*} \boldsymbol{b}=\boldsymbol{R}_{1}^{*} \boldsymbol{Q}_{1}^{*} \boldsymbol{b}$.	$\boldsymbol{A}^{*} \boldsymbol{A}=\boldsymbol{R}_{1}^{*} \boldsymbol{Q}_{1}^{*} \boldsymbol{Q}_{1} \boldsymbol{R}_{1}=\boldsymbol{R}_{1}^{*} \boldsymbol{R}_{1}, \quad \boldsymbol{A}^{*} \boldsymbol{b}=\boldsymbol{R}_{1}^{*} \boldsymbol{Q}_{1}^{*} \boldsymbol{b}$.
lyche-numerical-linear-algebra_EQ0605	222	1.000	A=U_{1} \Sigma_{1} V_{1}^{*}, \quad A^{\dagger}:=V_{1} \Sigma_{1}^{-1} U_{1}^{*}	$A=U_{1} \Sigma_{1} V_{1}^{*}, \quad A^{\dagger}:=V_{1} \Sigma_{1}^{-1} U_{1}^{*}$	$\boldsymbol{A}=\boldsymbol{U}_{1} \boldsymbol{\Sigma}_{1} \boldsymbol{V}_{1}^{*}, \quad \boldsymbol{A}^{\dagger}:=\boldsymbol{V}_{1} \boldsymbol{\Sigma}_{1}^{-1} \boldsymbol{U}_{1}^{*}$
lyche-numerical-linear-algebra_EQ0612	224	1.000	\boldsymbol{x}=\boldsymbol{A}^{\dagger} \boldsymbol{b}= \boldsymbol{A}^{\dagger} \boldsymbol{b}_{1}, \quad \boldsymbol{A}^{\dagger}=\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1} \boldsymbol{A}^{*},	$\boldsymbol{x}=\boldsymbol{A}^{\dagger} \boldsymbol{b}=\boldsymbol{A}^{\dagger} \boldsymbol{b}_{1}, \quad \boldsymbol{A}^{\dagger}=\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1} \boldsymbol{A}^{*},$	$\boldsymbol{x}=\boldsymbol{A}^{\dagger} \boldsymbol{b}=\boldsymbol{A}^{\dagger} \boldsymbol{b}_{1}, \quad \boldsymbol{A}^{\dagger}=\left(\boldsymbol{A}^{*} \boldsymbol{A}\right)^{-1} \boldsymbol{A}^{*},$
lyche-numerical-linear-algebra_EQ0616	226	1.000	\boldsymbol{b}_{1}=\boldsymbol{A} \boldsymbol{A}^{ \dagger} \boldsymbol{b}=\left[10^{-4}, 0,0\right]^{*}, \quad \text { and } \quad \boldsymbol{e}_{1}= \boldsymbol{A} \boldsymbol{A}^{\dagger} \boldsymbol{e}= \left[10^{-6}, 0,0\right]^{*} .	$\boldsymbol{b}_{1}=\boldsymbol{A} \boldsymbol{A}^{\dagger} \boldsymbol{b}=\left[10^{-4}, 0,0\right]^{*}, \quad \text { and } \quad \boldsymbol{e}_{1}=\boldsymbol{A} \boldsymbol{A}^{\dagger} \boldsymbol{e}=\left[10^{-6}, 0,0\right]^{*}.$	$\boldsymbol{b}_{1}=\boldsymbol{A} \boldsymbol{A}^{\dagger} \boldsymbol{b}=\left[10^{-4}, 0,0\right]^{*}, \quad \text { and } \quad \boldsymbol{e}_{1}=\boldsymbol{A} \boldsymbol{A}^{\dagger} \boldsymbol{e}=\left[10^{-6}, 0,0\right]^{*}.$
lyche-numerical-linear-algebra_EQ0618	226	1.000	\frac{\\|\boldsymbol{x}-\boldsymbol{y}\\|_{ \infty}}{\\|\boldsymbol{x}\\|_{\infty}}= \frac{10^{-6}}{10^{-4}}=10^{-2}	$\frac{\\|\boldsymbol{x}-\boldsymbol{y}\\|_{\infty}}{\\|\boldsymbol{x}\\|_{\infty}}=\frac{10^{-6}}{10^{-4}}=10^{-2},$	$\frac{\\|\boldsymbol{x}-\boldsymbol{y}\\|_{\infty}}{\\|\boldsymbol{x}\\|_{\infty}}=\frac{10^{-6}}{10^{-4}}=10^{-2},$
lyche-numerical-linear-algebra_EQ0619 (9.15)	226	1.000	\rho=\frac{\\|\boldsymbol{x}-\boldsymbol{y}\\|_{2}}{\\| \boldsymbol{x}\\|_{2}} \leq \frac{1}{\alpha} K(1+\beta K) \frac{\\|\boldsymbol{E}\\|_{2}}{\\|\boldsymbol{A}\\|_{2}}, \quad \beta=\frac{\left\\|\boldsymbol{b}_{2}\right\\|_{2}}{ \left\\|\boldsymbol{b}_{1}\right\\|_{2}}, \quad K=\\| \boldsymbol{A}\\|_{2}\left\\|\boldsymbol{A}^{\dagger} \right\\|_{2} .	$\rho=\frac{\\|\boldsymbol{x}-\boldsymbol{y}\\|_{2}}{\\|\boldsymbol{x}\\|_{2}} \leq \frac{1}{\alpha} K(1+\beta K) \frac{\\|\boldsymbol{E}\\|_{2}}{\\|\boldsymbol{A}\\|_{2}}, \quad \beta=\frac{\left\\|\boldsymbol{b}_{2}\right\\|_{2}}{\left\\|\boldsymbol{b}_{1}\right\\|_{2}}, \quad K=\\|\boldsymbol{A}\\|_{2}\left\\|\boldsymbol{A}^{\dagger}\right\\|_{2}.$	$\rho=\frac{\\|\boldsymbol{x}-\boldsymbol{y}\\|_{2}}{\\|\boldsymbol{x}\\|_{2}} \leq \frac{1}{\alpha} K(1+\beta K) \frac{\\|\boldsymbol{E}\\|_{2}}{\\|\boldsymbol{A}\\|_{2}}, \quad \beta=\frac{\left\\|\boldsymbol{b}_{2}\right\\|_{2}}{\left\\|\boldsymbol{b}_{1}\right\\|_{2}}, \quad K=\\|\boldsymbol{A}\\|_{2}\left\\|\boldsymbol{A}^{\dagger}\right\\|_{2}.$
lyche-numerical-linear-algebra_EQ0623 (9.18)	228	1.000	\left|\alpha_{j}-\beta_{j}\right| \leq\\|\boldsymbol{A}- \boldsymbol{B}\\|_{2}, \text { for } j=1,2, \ldots, n .	$\left\|\alpha_{j}-\beta_{j}\right\| \leq\\|\boldsymbol{A}-\boldsymbol{B}\\|_{2}, \text { for } j=1,2, \ldots, n.$	$\left\|\alpha_{j}-\beta_{j}\right\| \leq\\|\boldsymbol{A}-\boldsymbol{B}\\|_{2}, \text { for } j=1,2, \ldots, n.$
lyche-numerical-linear-algebra_EQ0625	228	1.000	\left\\|(\boldsymbol{A}+\boldsymbol{E})^{\dagger}\right \\|_{2}=\frac{1}{\beta_{r}} \leq \frac{1}{\alpha_{r}- \epsilon_{1}}=\frac{1 / \alpha_{r}}{1-\epsilon_{1} / \alpha_{r}}=\frac{\left\\|\boldsymbol{A}^{\dagger}\right \\|_{2}}{1-\left\\|\boldsymbol{A}^{\dagger}\right\\|_{2}\left\\| \boldsymbol{E}\right\\|_{2}} .	$\left\\|(\boldsymbol{A}+\boldsymbol{E})^{\dagger}\right\\|_{2}=\frac{1}{\beta_{r}} \leq \frac{1}{\alpha_{r}-\epsilon_{1}}=\frac{1/\alpha_{r}}{1-\epsilon_{1}/\alpha_{r}}=\frac{\left\\|\boldsymbol{A}^{\dagger}\right\\|_{2}}{1-\left\\|\boldsymbol{A}^{\dagger}\right\\|_{2}\left\\|\boldsymbol{E}\right\\|_{2}}.$	$\left\\|(\boldsymbol{A}+\boldsymbol{E})^{\dagger}\right\\|_{2}=\frac{1}{\beta_{r}} \leq \frac{1}{\alpha_{r}-\epsilon_{1}}=\frac{1/\alpha_{r}}{1-\epsilon_{1}/\alpha_{r}}=\frac{\left\\|\boldsymbol{A}^{\dagger}\right\\|_{2}}{1-\left\\|\boldsymbol{A}^{\dagger}\right\\|_{2}\left\\|\boldsymbol{E}\right\\|_{2}}.$
lyche-numerical-linear-algebra_EQ0626 (9.19)	228	1.000	\sum_{j=1}^{n}\left|\mu_{j}-\lambda_{j}\right|^{2} \leq\\| \boldsymbol{A}-\boldsymbol{B}\\|_{F}^{2}:=\sum_{i=1}^{n} \sum_{j=1}^{n}\left|a_{i j}-b_{i j}\right|^{2},	$\sum_{j=1}^{n}\left\|\mu_{j}-\lambda_{j}\right\|^{2} \leq\\|\boldsymbol{A}-\boldsymbol{B}\\|_{F}^{2}:=\sum_{i=1}^{n} \sum_{j=1}^{n}\left\|a_{i j}-b_{i j}\right\|^{2},$	$\sum_{j=1}^{n}\left\|\mu_{j}-\lambda_{j}\right\|^{2} \leq\\|\boldsymbol{A}-\boldsymbol{B}\\|_{F}^{2}:=\sum_{i=1}^{n} \sum_{j=1}^{n}\left\|a_{i j}-b_{i j}\right\|^{2},$
lyche-numerical-linear-algebra_EQ0627 (9.20)	229	1.000	\sum_{j=1}^{n}\left|\beta_{j}-\alpha_{j}\right|^{2} \leq \\|\boldsymbol{A}-\boldsymbol{B}\\|_{F}^{2} .	$\sum_{j=1}^{n}\left\|\beta_{j}-\alpha_{j}\right\|^{2} \leq\\|\boldsymbol{A}-\boldsymbol{B}\\|_{F}^{2}.$	$\sum_{j=1}^{n}\left\|\beta_{j}-\alpha_{j}\right\|^{2} \leq\\|\boldsymbol{A}-\boldsymbol{B}\\|_{F}^{2}.$
lyche-numerical-linear-algebra_EQ0629 (9.21)	229	1.000	\sum_{j=1}^{m+n}\left|\lambda_{j}-\mu_{j}\right|^{2} \leq \\|\boldsymbol{C}-\boldsymbol{D}\\|_{F}^{2} .	$\sum_{j=1}^{m+n}\left\|\lambda_{j}-\mu_{j}\right\|^{2} \leq\\|\boldsymbol{C}-\boldsymbol{D}\\|_{F}^{2}.$	$\sum_{j=1}^{m+n}\left\|\lambda_{j}-\mu_{j}\right\|^{2} \leq\\|\boldsymbol{C}-\boldsymbol{D}\\|_{F}^{2}.$
lyche-numerical-linear-algebra_EQ0631	229	1.000	t:=\max (r, s) .	$t:=\max(r, s).$	$t:=\max(r, s).$

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lyche-numerical-linear-algebra_EQ0633	230	1.000	`\sum_{j=1}^{m+n}\left|\lambda_{j}-\mu_{j}\right|^{2}= \sum_{i=1}^{t}\left|\alpha_{i}-\beta_{i}\right|^{2}+ \sum_{i=1}^{t}\left|-\alpha_{i}+\beta_{i}\right|^{2}=2 \sum_{i=1}^{t}\left|\alpha_{i}-\beta_{i}\right|^{2}`	$\sum_{j=1}^{m+n}\left\|\lambda_{j}-\mu_{j}\right\|^{2}=\sum_{i=1}^{t}\left\|\alpha_{i}-\beta_{i}\right\|^{2}+\sum_{i=1}^{t}\left\|-\alpha_{i}+\beta_{i}\right\|^{2}=2 \sum_{i=1}^{t}\left\|\alpha_{i}-\beta_{i}\right\|^{2}$	$\sum_{j=1}^{m+n}\left\|\lambda_{j}-\mu_{j}\right\|^{2}=\sum_{i=1}^{t}\left\|\alpha_{i}-\beta_{i}\right\|^{2}+\sum_{i=1}^{t}\left\|-\alpha_{i}+\beta_{i}\right\|^{2}=2 \sum_{i=1}^{t}\left\|\alpha_{i}-\beta_{i}\right\|^{2}$
lyche-numerical-linear-algebra_EQ0635 (9.22)	230	1.000	`\left(t_{i}-c_{1}\right)^{2}+\left(y_{i}-c_{2} \right)^{2}=r^{2}, i=1, \ldots, m,`	$\left(t_{i}-c_{1}\right)^{2}+\left(y_{i}-c_{2} \right)^{2}=r^{2}, i=1, \ldots, m,$	$\left(t_{i}-c_{1}\right)^{2}+\left(y_{i}-c_{2} \right)^{2}=r^{2},\ i=1, \ldots, m,$
lyche-numerical-linear-algebra_EQ0636 (9.23)	230	1.000	`t_{i} x_{1}+y_{i} x_{2}+x_{3}=t_{i}^{2}+y_{i}^{2}, i=1, \ldots, m,`	$t_{i} x_{1}+y_{i} x_{2}+x_{3}=t_{i}^{2}+y_{i}^{2}, i=1, \ldots, m,$	$t_{i} x_{1}+y_{i} x_{2}+x_{3}=t_{i}^{2}+y_{i}^{2},\ i=1, \ldots, m,$
lyche-numerical-linear-algebra_EQ0637	231	1.000	`\sum_{i=1}^{3}\left|p\left(x_{i}\right)-y_{i}\right \\|^{2},`	$\sum_{i=1}^{3}\left\|p\left(x_{i}\right)-y_{i}\right\|^{2},$	$\sum_{i=1}^{3}\left\|p\left(x_{i}\right)-y_{i}\right\|^{2},$
lyche-numerical-linear-algebra_EQ0638	231	1.000	`F(\boldsymbol{x}):=\\|\boldsymbol{A} \boldsymbol{x}- \boldsymbol{b}\\|_{2}^{2}+\\|\boldsymbol{x}\\|_{2}^{2} .`	$F(\boldsymbol{x}):=\|\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b}\|_{2}^{2}+\|\boldsymbol{x}\|_{2}^{2}.$	$F(\boldsymbol{x}):=\|\boldsymbol{A} \boldsymbol{x}-\boldsymbol{b}\|_{2}^{2}+\|\boldsymbol{x}\|_{2}^{2}.$
lyche-numerical-linear-algebra_EQ0639	231	1.000	`F(\boldsymbol{x})=\boldsymbol{x}^{T} \boldsymbol{B} \boldsymbol{x}-2 \boldsymbol{c}^{T} \boldsymbol{x}+ \boldsymbol{b}^{T} \boldsymbol{b}, \quad \text { where } \quad \boldsymbol{c}=\boldsymbol{A}^{T} \boldsymbol{b} .`	$F(\boldsymbol{x})=\boldsymbol{x}^{T} \boldsymbol{B} \boldsymbol{x}-2 \boldsymbol{c}^{T} \boldsymbol{x}+\boldsymbol{b}^{T} \boldsymbol{b}, \quad \text { where } \quad \boldsymbol{c}=\boldsymbol{A}^{T} \boldsymbol{b}.$	$F(\boldsymbol{x})=\boldsymbol{x}^{T} \boldsymbol{B} \boldsymbol{x}-2 \boldsymbol{c}^{T} \boldsymbol{x}+\boldsymbol{b}^{T} \boldsymbol{b}, \quad \text { where } \quad \boldsymbol{c}=\boldsymbol{A}^{T} \boldsymbol{b}.$
lyche-numerical-linear-algebra_EQ0640 (9.24)	231	1.000	`\\|\boldsymbol{r}(\boldsymbol{x})\\|_{D}^{2}:= \sum_{i=1}^{m} r_{i}(x)^{2} d_{i}, \quad \boldsymbol{x} \in \mathbb{R}^{n}`	$\\|\boldsymbol{r}(\boldsymbol{x})\\|_{D}^{2}:=\sum_{i=1}^{m} r_{i}(x)^{2} d_{i}, \quad \boldsymbol{x} \in \mathbb{R}^{n}$	$\\|\boldsymbol{r}(\boldsymbol{x})\\|_{D}^{2}:=\sum_{i=1}^{m} r_{i}(x)^{2} d_{i}, \quad \boldsymbol{x} \in \mathbb{R}^{n},$
lyche-numerical-linear-algebra_EQ0642	232	1.000	`\boldsymbol{A}^{T} \boldsymbol{D} \boldsymbol{A} \boldsymbol{x}=\boldsymbol{A}^{T} \boldsymbol{D} \boldsymbol{b} .`	$\boldsymbol{A}^{T} \boldsymbol{D} \boldsymbol{A} \boldsymbol{x}=\boldsymbol{A}^{T} \boldsymbol{D} \boldsymbol{b}.$	$\boldsymbol{A}^{T} \boldsymbol{D} \boldsymbol{A} \boldsymbol{x}=\boldsymbol{A}^{T} \boldsymbol{D} \boldsymbol{b}.$
lyche-numerical-linear-algebra_EQ0643	232	1.000	`K_{2}\left(\boldsymbol{A}^{T} \boldsymbol{D} \boldsymbol{A}\right) \leq K_{2}\left(\boldsymbol{A}^{T} \boldsymbol{A}\right) K_{2}(\boldsymbol{D}),`	$K_{2}\left(\boldsymbol{A}^{T} \boldsymbol{D} \boldsymbol{A}\right) \leq K_{2}\left(\boldsymbol{A}^{T} \boldsymbol{A}\right) K_{2}(\boldsymbol{D}),$	$K_{2}\left(\boldsymbol{A}^{T} \boldsymbol{D} \boldsymbol{A}\right) \leq K_{2}\left(\boldsymbol{A}^{T} \boldsymbol{A}\right) K_{2}(\boldsymbol{D}),$
lyche-numerical-linear-algebra_EQ0646 (9.25)	233	1.000	`\begin{aligned} & \boldsymbol{P}_{\mathcal{R} \left(\boldsymbol{A}^{*}\right)}=\boldsymbol{A}^{ \dagger} \boldsymbol{A}=\boldsymbol{V}_{1} \boldsymbol{V}_{1}^{*}=\sum_{j=1}^{r} \boldsymbol{v}_{j} \boldsymbol{v}_{j}^{*} \in \mathbb{C}^{n \times n} \\ & \boldsymbol{P}_{\mathcal{N}(\boldsymbol{A})}=\boldsymbol{I}-\boldsymbol{A}^{ \dagger} \boldsymbol{A}=\boldsymbol{V}_{2} \boldsymbol{V}_{2}^{*}=\sum_{j=r+1}^{n} \boldsymbol{v}_{j} \boldsymbol{v}_{j}^{*} \in \mathbb{C}^{n \times n} . \end{aligned}`	$\begin{aligned} & \boldsymbol{P}_{\mathcal{R}\left(\boldsymbol{A}^{*}\right)}=\boldsymbol{A}^{\dagger} \boldsymbol{A}=\boldsymbol{V}_{1} \boldsymbol{V}_{1}^{*}=\sum_{j=1}^{r} \boldsymbol{v}_{j} \boldsymbol{v}_{j}^{*} \in \mathbb{C}^{n \times n} \\ & \boldsymbol{P}_{\mathcal{N}(\boldsymbol{A})}=\boldsymbol{I}-\boldsymbol{A}^{\dagger} \boldsymbol{A}=\boldsymbol{V}_{2} \boldsymbol{V}_{2}^{*}=\sum_{j=r+1}^{n} \boldsymbol{v}_{j} \boldsymbol{v}_{j}^{*} \in \mathbb{C}^{n \times n} . \end{aligned}$	$\begin{aligned} & \boldsymbol{P}_{\mathcal{R}\left(\boldsymbol{A}^{*}\right)}=\boldsymbol{A}^{\dagger} \boldsymbol{A}=\boldsymbol{V}_{1} \boldsymbol{V}_{1}^{*}=\sum_{j=1}^{r} \boldsymbol{v}_{j} \boldsymbol{v}_{j}^{*} \in \mathbb{C}^{n \times n} \\ & \boldsymbol{P}_{\mathcal{N}(\boldsymbol{A})}=\boldsymbol{I}-\boldsymbol{A}^{\dagger} \boldsymbol{A}=\boldsymbol{V}_{2} \boldsymbol{V}_{2}^{*}=\sum_{j=r+1}^{n} \boldsymbol{v}_{j} \boldsymbol{v}_{j}^{*} \in \mathbb{C}^{n \times n} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0652	234	1.000	`A=\left[\begin{array}{l} B \\ C \end{array}\right]`	$A=\left[\begin{array}{l} B \\ C \end{array}\right]$	$A=\left[\begin{array}{l} B \\ C \end{array}\right]$
lyche-numerical-linear-algebra_EQ0653	235	1.000	`\boldsymbol{A}=\left[\begin{array}{ll} 1 & 2 \\ 1 & 1 \\ 1 & 1 \end{array}\right], \quad \boldsymbol{b}=\left[ \begin{array}{l} b_{1} \\ b_{2} \\ b_{3} \end{array} \right] .`	$\boldsymbol{A}=\left[\begin{array}{ll} 1 & 2 \\ 1 & 1 \\ 1 & 1 \end{array}\right], \quad \boldsymbol{b}=\left[\begin{array}{l} b_{1} \\ b_{2} \\ b_{3} \end{array} \right] .$	$\boldsymbol{A}=\left[\begin{array}{ll} 1 & 2 \\ 1 & 1 \\ 1 & 1 \end{array}\right], \quad \boldsymbol{b}=\left[\begin{array}{l} b_{1} \\ b_{2} \\ b_{3} \end{array} \right] .$

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lyche-numerical-linear-algebra_EQ0655	235	1.000	`\left|\sigma_{i}(\epsilon)-\sigma_{i}(0)\right| \leq| \epsilon|, \quad i=1, \ldots, n,`	$\left\|\sigma_{i}(\epsilon)-\sigma_{i}(0)\right\| \leq\|\epsilon\|, \quad i=1, \ldots, n,$	$\left\|\sigma_{i}(\epsilon)-\sigma_{i}(0)\right\| \leq\|\epsilon\|, \quad i=1, \ldots, n,$
lyche-numerical-linear-algebra_EQ0657	238	1.000	`\bar{\Omega}_{h}:=\{(j h, k h): j, k=0,1, \ldots, m+1\}, \quad \text { where } \quad h=1 /(m+1) .`	$\bar{\Omega}_{h}:=\{(j h, k h): j, k=0,1, \ldots, m+1\}, \quad \text { where } \quad h=1 /(m+1) .$	$\bar{\Omega}_{h}:=\{(j h, k h): j, k=0,1, \ldots, m+1\}, \quad \text { where } \quad h=1 /(m+1) .$
lyche-numerical-linear-algebra_EQ0658 (10.2)	239	1.000	`\frac{\partial^{2} u(j h, k h)}{\partial x^{2}} \approx \frac{v_{j-1, k}-2 v_{j, k}+v_{j+1, k}}{h^{2}}, \frac{ \partial^{2} u(j h, k h)}{\partial y^{2}} \approx \frac{v_{j, k-1}-2 v_{j, k}+v_{j, k+1}}{h^{2}} .`	$\frac{\partial^{2} u(j h, k h)}{\partial x^{2}} \approx \frac{v_{j-1, k}-2 v_{j, k}+v_{j+1, k}}{h^{2}}, \frac{\partial^{2} u(j h, k h)}{\partial y^{2}} \approx \frac{v_{j, k-1}-2 v_{j, k}+v_{j, k+1}}{h^{2}} .$	$\frac{\partial^{2} u(j h, k h)}{\partial x^{2}} \approx \frac{v_{j-1, k}-2 v_{j, k}+v_{j+1, k}}{h^{2}}, \frac{\partial^{2} u(j h, k h)}{\partial y^{2}} \approx \frac{v_{j, k-1}-2 v_{j, k}+v_{j, k+1}}{h^{2}} .$
lyche-numerical-linear-algebra_EQ0660 (10.4)	239	1.000	`-\Delta_{h} v_{j, k}:=\frac{-v_{j-1, k}+2 v_{j, k}-v_{j+1, k}}{h^{2}}+\frac{-v_{j, k-1}+2 v_{j, k}-v_{j, k+1}}{h^{2}} .`	$-\Delta_{h} v_{j, k}:=\frac{-v_{j-1, k}+2 v_{j, k}-v_{j+1, k}}{h^{2}}+\frac{-v_{j, k-1}+2 v_{j, k}-v_{j, k+1}}{h^{2}} .$	$-\Delta_{h} v_{j, k}:=\frac{-v_{j-1, k}+2 v_{j, k}-v_{j+1, k}}{h^{2}}+\frac{-v_{j, k-1}+2 v_{j, k}-v_{j, k+1}}{h^{2}} .$
lyche-numerical-linear-algebra_EQ0662 (10.6)	239	1.000	`\boldsymbol{V}:=\left[\begin{array}{ccc} v_{1,1} & \cdots & v_{1, m} \\ \vdots & & \vdots \\ v_{m, 1} & \cdots & v_{m, m} \end{array}\right] \in \mathbb{R}^{m \times m}, \quad \boldsymbol{F}:=\left[\begin{array}{ccc} f_{1,1} & \cdots & f_{1, m} \\ \vdots & & \vdots \\ f_{m, 1} & \cdots & f_{m, m} \end{array}\right] \in \mathbb{R}^{m \times m} .`	$\boldsymbol{V}:=\left[\begin{array}{ccc} v_{1,1} & \cdots & v_{1, m} \\ \vdots & & \vdots \\ v_{m, 1} & \cdots & v_{m, m} \end{array}\right] \in \mathbb{R}^{m \times m}, \quad \boldsymbol{F}:=\left[\begin{array}{ccc} f_{1,1} & \cdots & f_{1, m} \\ \vdots & & \vdots \\ f_{m, 1} & \cdots & f_{m, m} \end{array}\right] \in \mathbb{R}^{m \times m} .$	$\boldsymbol{V}:=\left[\begin{array}{ccc} v_{1,1} & \cdots & v_{1, m} \\ \vdots & & \vdots \\ v_{m, 1} & \cdots & v_{m, m} \end{array}\right] \in \mathbb{R}^{m \times m}, \quad \boldsymbol{F}:=\left[\begin{array}{ccc} f_{1,1} & \cdots & f_{1, m} \\ \vdots & & \vdots \\ f_{m, 1} & \cdots & f_{m, m} \end{array}\right] \in \mathbb{R}^{m \times m} .$
lyche-numerical-linear-algebra_EQ0663	239	1.000	`\sum_{i=1}^{m} \boldsymbol{T}_{j, i} v_{i, k}+ \sum_{i=1}^{m} v_{j, i} \boldsymbol{T}_{i, k}=-v_{j-1, k}+2 v_{j, k}-v_{j+1, k}-v_{j, k-1}+2 v_{j, k}-v_{j, k+1},`	$\sum_{i=1}^{m} \boldsymbol{T}_{j, i} v_{i, k}+ \sum_{i=1}^{m} v_{j, i} \boldsymbol{T}_{i, k}=-v_{j-1, k}+2 v_{j, k}-v_{j+1, k}-v_{j, k-1}+2 v_{j, k}-v_{j, k+1},$	$\sum_{i=1}^{m} \boldsymbol{T}_{j, i} v_{i, k}+ \sum_{i=1}^{m} v_{j, i} \boldsymbol{T}_{i, k}=-v_{j-1, k}+2 v_{j, k}-v_{j+1, k}-v_{j, k-1}+2 v_{j, k}-v_{j, k+1},$
lyche-numerical-linear-algebra_EQ0664	239	1.000	`\operatorname{vec}(\boldsymbol{B}):=\left[b_{11}, \ldots, b_{m 1}, b_{12}, \ldots, b_{m 2}, \ldots, b_{1 n}, \ldots, b_{m n}\right]^{T} \in \mathbb{R}^{m n}`	$\operatorname{vec}(\boldsymbol{B}):=\left[b_{11}, \ldots, b_{m 1}, b_{12}, \ldots, b_{m 2}, \ldots, b_{1 n}, \ldots, b_{m n}\right]^{T} \in \mathbb{R}^{m n}$	$\operatorname{vec}(\boldsymbol{B}):=\left[b_{11}, \ldots, b_{m 1}, b_{12}, \ldots, b_{m 2}, \ldots, b_{1 n}, \ldots, b_{m n}\right]^{T} \in \mathbb{R}^{m n}$
lyche-numerical-linear-algebra_EQ0665	240	1.000	`4 x_{i}-x_{i-1}-x_{i+1}-x_{i-m}-x_{i+m}=b_{i},`	$4 x_{i}-x_{i-1}-x_{i+1}-x_{i-m}-x_{i+m}=b_{i},$	$4 x_{i}-x_{i-1}-x_{i+1}-x_{i-m}-x_{i+m}=b_{i},$
lyche-numerical-linear-algebra_EQ0669 (10.9)	241	1.000	`\boldsymbol{T}_{1}:=\operatorname{tridiag}(a, d, a) .`	$\boldsymbol{T}_{1}:=\operatorname{tridiag}(a, d, a) .$	$\boldsymbol{T}_{1}:=\operatorname{tridiag}(a, d, a) .$
lyche-numerical-linear-algebra_EQ0672	242	1.000	`\boldsymbol{C}=\left[\begin{array}{cccc} \boldsymbol{A} b_{1,1} & \boldsymbol{A} b_{1,2} & \cdots & \boldsymbol{A} b_{1, s} \\ \boldsymbol{A} b_{2,1} & \boldsymbol{A} b_{2,2} & \cdots & \boldsymbol{A} b_{2, s} \\ \vdots & \vdots & \ddots & \vdots \\ \boldsymbol{A} b_{r, 1} & \boldsymbol{A} b_{r, 2} & \cdots & \boldsymbol{A} b_{r, s} \end{array}\right] .`	$\boldsymbol{C}=\left[\begin{array}{cccc} \boldsymbol{A} b_{1,1} & \boldsymbol{A} b_{1,2} & \cdots & \boldsymbol{A} b_{1, s} \\ \boldsymbol{A} b_{2,1} & \boldsymbol{A} b_{2,2} & \cdots & \boldsymbol{A} b_{2, s} \\ \vdots & \vdots & \ddots & \vdots \\ \boldsymbol{A} b_{r, 1} & \boldsymbol{A} b_{r, 2} & \cdots & \boldsymbol{A} b_{r, s} \end{array}\right] .$	$\boldsymbol{C}=\left[\begin{array}{cccc} \boldsymbol{A} b_{1,1} & \boldsymbol{A} b_{1,2} & \cdots & \boldsymbol{A} b_{1, s} \\ \boldsymbol{A} b_{2,1} & \boldsymbol{A} b_{2,2} & \cdots & \boldsymbol{A} b_{2, s} \\ \vdots & \vdots & \ddots & \vdots \\ \boldsymbol{A} b_{r, 1} & \boldsymbol{A} b_{r, 2} & \cdots & \boldsymbol{A} b_{r, s} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0673	242	1.000	`\boldsymbol{T}_{1}=\left[\begin{array}{ccc} d & a & 0 \\ a & d & a \\ 0 & a & d \end{array}\right], \quad \boldsymbol{I}=\left[\begin{array}{lll} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array}\right]`	$\boldsymbol{T}_{1}=\left[\begin{array}{ccc} d & a & 0 \\ a & d & a \\ 0 & a & d \end{array}\right], \quad \boldsymbol{I}=\left[\begin{array}{lll} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array}\right]$	$\boldsymbol{T}_{1}=\left[\begin{array}{ccc} d & a & 0 \\ a & d & a \\ 0 & a & d \end{array}\right], \quad \boldsymbol{I}=\left[\begin{array}{lll} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array}\right]$

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lyche-numerical-linear-algebra_EQ0675 (10.12)	243	■ 1.000	\boldsymbol{T}_{2}=\boldsymbol{T}_{1} \otimes \boldsymbol{I}+\boldsymbol{I} \otimes \boldsymbol{T}_{1}, \quad \boldsymbol{T}_{1}, \boldsymbol{I} \in \mathbb{R}^{m \times m}, \quad \boldsymbol{T}_{2} \in \mathbb{R}^{\left(m^{2}\right) \times\left(m^{2}\right)} .	$\boldsymbol{T}_2=\boldsymbol{T}_1 \otimes \boldsymbol{I}+\boldsymbol{I} \otimes \boldsymbol{T}_1, \quad \boldsymbol{T}_1, \boldsymbol{I} \in \mathbb{R}^{m \times m}, \quad \boldsymbol{T}_2 \in \mathbb{R}^{\left(m^2\right) \times\left(m^2\right)}.$	$\boldsymbol{T}_2=\boldsymbol{T}_1 \otimes \boldsymbol{I}+\boldsymbol{I} \otimes \boldsymbol{T}_1, \quad \boldsymbol{T}_1, \boldsymbol{I} \in \mathbb{R}^{m \times m}, \quad \boldsymbol{T}_2 \in \mathbb{R}^{\left(m^2\right) \times\left(m^2\right)}.$
lyche-numerical-linear-algebra_EQ0678	243	■ 1.000	(\boldsymbol{A} \otimes \boldsymbol{B})(\boldsymbol{C} \otimes \boldsymbol{D})=\left[\begin{array}{ccc} \boldsymbol{A} b_{1,1} & \cdots & \boldsymbol{A} b_{1, t} \\ \vdots & & \vdots \\ \boldsymbol{A} b_{r, 1} & \cdots & \boldsymbol{A} b_{r, t} \end{array}\right] \left[\begin{array}{ccc} \boldsymbol{C} d_{1,1} & \cdots & \boldsymbol{C} d_{1, s} \\ \vdots & & \vdots \\ \boldsymbol{C} d_{t, 1} & \cdots & \boldsymbol{C} d_{t, s} \end{array}\right] .	$(\boldsymbol{A} \otimes \boldsymbol{B})(\boldsymbol{C} \otimes \boldsymbol{D})=\left[\begin{array}{ccc} \boldsymbol{A} b_{1,1} & \cdots & \boldsymbol{A} b_{1, t} \\ \vdots & & \vdots \\ \boldsymbol{A} b_{r, 1} & \cdots & \boldsymbol{A} b_{r, t} \end{array}\right] \left[\begin{array}{ccc} \boldsymbol{C} d_{1,1} & \cdots & \boldsymbol{C} d_{1, s} \\ \vdots & & \vdots \\ \boldsymbol{C} d_{t, 1} & \cdots & \boldsymbol{C} d_{t, s} \end{array}\right] .$	$(\boldsymbol{A} \otimes \boldsymbol{B})(\boldsymbol{C} \otimes \boldsymbol{D})=\left[\begin{array}{ccc} \boldsymbol{A} b_{1,1} & \cdots & \boldsymbol{A} b_{1, t} \\ \vdots & & \vdots \\ \boldsymbol{A} b_{r, 1} & \cdots & \boldsymbol{A} b_{r, t} \end{array}\right] \left[\begin{array}{ccc} \boldsymbol{C} d_{1,1} & \cdots & \boldsymbol{C} d_{1, s} \\ \vdots & & \vdots \\ \boldsymbol{C} d_{t, 1} & \cdots & \boldsymbol{C} d_{t, s} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0681	245	■ 1.000	\begin{aligned} \left(\boldsymbol{A} \otimes \boldsymbol{I}_{s}+\boldsymbol{I}_{r} \otimes \boldsymbol{B}\right) \operatorname{vec}(\boldsymbol{V}) & =\operatorname{vec}(\boldsymbol{F}) \\ \Leftrightarrow \quad\left(\boldsymbol{A} \boldsymbol{V} \boldsymbol{I}_{s}^{T}+\boldsymbol{I}_{r} \boldsymbol{V} \boldsymbol{B}^{T}\right) & =\boldsymbol{F} \quad \Leftrightarrow \quad \boldsymbol{A} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{B}^{T}=\boldsymbol{F} . \end{aligned}	$\begin{aligned} &\left(\boldsymbol{A} \otimes \boldsymbol{I}_s+\boldsymbol{I}_r \otimes \boldsymbol{B}\right) \operatorname{vec}(\boldsymbol{V})=\operatorname{vec}(\boldsymbol{F}) \\ &\Leftrightarrow \quad\left(\boldsymbol{A} \boldsymbol{V} \boldsymbol{I}_s^T+\boldsymbol{I}_r \boldsymbol{V} \boldsymbol{B}^T\right)=\boldsymbol{F} \quad \Leftrightarrow \quad \boldsymbol{A} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{B}^T=\boldsymbol{F}. \end{aligned}$	$\begin{aligned} &\left(\boldsymbol{A} \otimes \boldsymbol{I}_s+\boldsymbol{I}_r \otimes \boldsymbol{B}\right) \operatorname{vec}(\boldsymbol{V})=\operatorname{vec}(\boldsymbol{F}) \\ &\Leftrightarrow \quad\left(\boldsymbol{A} \boldsymbol{V} \boldsymbol{I}_s^T+\boldsymbol{I}_r \boldsymbol{V} \boldsymbol{B}^T\right)=\boldsymbol{F} \quad \Leftrightarrow \quad \boldsymbol{A} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{B}^T=\boldsymbol{F}. \end{aligned}$
lyche-numerical-linear-algebra_EQ0683 (10.16)	246	■ 1.000	\boldsymbol{s}_{j}=[\sin (j \pi h), \sin (2 j \pi h), \ldots, \sin (m j \pi h)]^{T} .	$\boldsymbol{s}_j=[\sin(j \pi h), \sin(2 j \pi h), \ldots, \sin(m j \pi h)]^T.$	$\boldsymbol{s}_j=[\sin(j \pi h), \sin(2 j \pi h), \ldots, \sin(m j \pi h)]^T.$
lyche-numerical-linear-algebra_EQ0685 (10.18)	246	■ 1.000	\boldsymbol{T}_{2}\left(\boldsymbol{s}_{j} \otimes \boldsymbol{s}_{k}\right)=\left(\lambda_{j}+\lambda_{k}\right)\left(\boldsymbol{s}_{j} \otimes \boldsymbol{s}_{k}\right) \quad j, k=1, \ldots, m,	$\boldsymbol{T}_2\left(\boldsymbol{s}_j \otimes \boldsymbol{s}_k\right)=\left(\lambda_j+\lambda_k\right)\left(\boldsymbol{s}_j \otimes \boldsymbol{s}_k\right) \quad j, k=1, \ldots, m,$	$\boldsymbol{T}_2(\boldsymbol{s}_j \otimes \boldsymbol{s}_k)=(\lambda_j+\lambda_k)(\boldsymbol{s}_j \otimes \boldsymbol{s}_k) \quad j, k=1, \ldots, m,$
lyche-numerical-linear-algebra_EQ0688 (10.20)	246	■ 1.000	|\boldsymbol{A}|_{2}\left|\boldsymbol{A}^{-1}\right|_{2}=\frac{\cos ^{2} w}{\sin ^{2} w}, \quad w:=\frac{ \pi}{2(m+1)}	$\|\boldsymbol{A}\|_2\left\|\boldsymbol{A}^{-1}\right\|_2=\frac{\cos^2 w}{\sin^2 w}, \quad w:=\frac{\pi}{2(m+1)}.$	$\|\boldsymbol{A}\|_2\|\boldsymbol{A}^{-1}\|_2=\frac{\cos^2 w}{\sin^2 w}, \quad w:=\frac{\pi}{2(m+1)}.$
lyche-numerical-linear-algebra_EQ0689	246	■ 1.000	\lambda_{j, k}=4-2 \cos (2 j w)-2 \cos (2 k w)=4 \sin ^{2}(j w)+4 \sin ^{2}(k w), \quad j, k=1, \ldots, m .	$\lambda_{j,k}=4-2\cos(2jw)-2\cos(2kw)=4\sin^2(jw)+4\sin^2(kw), \quad j,k=1,\ldots,m.$	$\lambda_{j,k}=4-2\cos(2jw)-2\cos(2kw)=4\sin^2(jw)+4\sin^2(kw), \quad j,k=1,\ldots,m.$
lyche-numerical-linear-algebra_EQ0690	246	■ 1.000	\lambda_{\max }=8 \cos ^{2} w, \quad \lambda_{\min }=8 \sin ^{2} w .	$\lambda_{\max}=8\cos^2 w, \quad \lambda_{\min}=8\sin^2 w.$	$\lambda_{max}=8\cos^2 w, \quad \lambda_{min}=8\sin^2 w.$
lyche-numerical-linear-algebra_EQ0696	249	■ 1.000	(\boldsymbol{T} \otimes \boldsymbol{I}+\boldsymbol{I} \otimes \boldsymbol{T}) \operatorname{vec}(\boldsymbol{V})=h^{2} \operatorname{vec}(\boldsymbol{F}), \quad(\boldsymbol{T} \otimes \boldsymbol{I}+\boldsymbol{I} \otimes \boldsymbol{T}) \operatorname{vec}(\boldsymbol{U})=h^{2} \operatorname{vec}(\boldsymbol{V}) .	$(\boldsymbol{T} \otimes \boldsymbol{I}+\boldsymbol{I} \otimes \boldsymbol{T})\operatorname{vec}(\boldsymbol{V})=h^2\operatorname{vec}(\boldsymbol{F}), \quad (\boldsymbol{T} \otimes \boldsymbol{I}+\boldsymbol{I} \otimes \boldsymbol{T})\operatorname{vec}(\boldsymbol{U})=h^2\operatorname{vec}(\boldsymbol{V}).$	$(\boldsymbol{T} \otimes \boldsymbol{I}+\boldsymbol{I} \otimes \boldsymbol{T})\operatorname{vec}(\boldsymbol{V})=h^2\operatorname{vec}(\boldsymbol{F}), \quad (\boldsymbol{T} \otimes \boldsymbol{I}+\boldsymbol{I} \otimes \boldsymbol{T})\operatorname{vec}(\boldsymbol{U})=h^2\operatorname{vec}(\boldsymbol{V}).$
lyche-numerical-linear-algebra_EQ0697 (10.25)	249	■ 1.000	\boldsymbol{T}^{2} \boldsymbol{U}+2 \boldsymbol{T} \boldsymbol{U} \boldsymbol{T}+\boldsymbol{U} \boldsymbol{T}^{2}=h^{4} \boldsymbol{F} \quad \text { and } \quad \boldsymbol{A} \boldsymbol{x}=\boldsymbol{b},	$\boldsymbol{T}^2\boldsymbol{U}+2\boldsymbol{T}\boldsymbol{U}\boldsymbol{T}+\boldsymbol{U}\boldsymbol{T}^2=h^4\boldsymbol{F} \quad \text{and} \quad \boldsymbol{A}\boldsymbol{x}=\boldsymbol{b},$	$\boldsymbol{T}^2\boldsymbol{U}+2\boldsymbol{T}\boldsymbol{U}\boldsymbol{T}+\boldsymbol{U}\boldsymbol{T}^2=h^4\boldsymbol{F} \quad \text{and} \quad \boldsymbol{A}\boldsymbol{x}=\boldsymbol{b},$

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lyche-numerical-linear-algebra_EQ0700 (11.2)	252	1.000	\boldsymbol{U}_{1}=\boldsymbol{D}_{1}, \quad \boldsymbol{L}_{k}=\boldsymbol{A}_{k} \boldsymbol{U}_{k}^{-1}, \quad \boldsymbol{U}_{k+1}= \boldsymbol{D}_{k+1}-\boldsymbol{L}_{k} \boldsymbol{C}_{k}, \quad k=1,2, \ldots, m-1 .	$\boldsymbol{U}_{1}=\boldsymbol{D}_{1}, \quad \boldsymbol{L}_{k}=\boldsymbol{A}_{k} \boldsymbol{U}_{k}^{-1}, \quad \boldsymbol{U}_{k+1}=\boldsymbol{D}_{k+1}-\boldsymbol{L}_{k} \boldsymbol{C}_{k}, \quad k=1,2, \ldots, m-1 .$	$\boldsymbol{U}_{1}=\boldsymbol{D}_{1}, \quad \boldsymbol{L}_{k}=\boldsymbol{A}_{k} \boldsymbol{U}_{k}^{-1}, \quad \boldsymbol{U}_{k+1}=\boldsymbol{D}_{k+1}-\boldsymbol{L}_{k} \boldsymbol{C}_{k}, \quad k=1,2, \ldots, m-1 .$
lyche-numerical-linear-algebra_EQ0704 (11.4)	253	1.000	\boldsymbol{S}:=\left[\boldsymbol{s}_{1}, \ldots, \boldsymbol{s}_{m}\right]=[\sin (j k \pi h)]_{j, k=1}^{m} \in \mathbb{R}^{m \times m}, \quad \boldsymbol{D}= \operatorname{diag}\left(\lambda_{1}, \ldots, \lambda_{m} \right) .	$\boldsymbol{S}:=\left[\boldsymbol{s}_{1}, \ldots, \boldsymbol{s}_{m}\right]=[\sin (j k \pi h)]_{j, k=1}^{m} \in \mathbb{R}^{m \times m}, \quad \boldsymbol{D}=\operatorname{diag}\left(\lambda_{1}, \ldots, \lambda_{m} \right) .$	$\boldsymbol{S}:=\left[\boldsymbol{s}_{1}, \ldots, \boldsymbol{s}_{m}\right]=[\sin (j k \pi h)]_{j, k=1}^{m} \in \mathbb{R}^{m \times m}, \quad \boldsymbol{D}=\operatorname{diag}\left(\lambda_{1}, \ldots, \lambda_{m} \right) .$
lyche-numerical-linear-algebra_EQ0705 (2h)	253	1.000	\boldsymbol{T} \boldsymbol{S}=\left[\boldsymbol{T} \boldsymbol{s}_{1}, \ldots, \boldsymbol{T} \boldsymbol{s}_{m}\right]=\left[\lambda_{1} \boldsymbol{s}_{1}, \ldots, \lambda_{m} \boldsymbol{s}_{m}\right]=\boldsymbol{S} \boldsymbol{D}, \quad \boldsymbol{S}^{2}=\boldsymbol{S}^{T} \boldsymbol{S}=\frac{1}{2 h} \boldsymbol{I} .	$\boldsymbol{T} \boldsymbol{S}=\left[\boldsymbol{T} \boldsymbol{s}_{1}, \ldots, \boldsymbol{T} \boldsymbol{s}_{m}\right]=\left[\lambda_{1} \boldsymbol{s}_{1}, \ldots, \lambda_{m} \boldsymbol{s}_{m}\right]=\boldsymbol{S} \boldsymbol{D}, \quad \boldsymbol{S}^{2}=\boldsymbol{S}^{T} \boldsymbol{S}=\frac{1}{2 h} \boldsymbol{I} .$	$\boldsymbol{T} \boldsymbol{S}=\left[\boldsymbol{T} \boldsymbol{s}_{1}, \ldots, \boldsymbol{T} \boldsymbol{s}_{m}\right]=\left[\lambda_{1} \boldsymbol{s}_{1}, \ldots, \lambda_{m} \boldsymbol{s}_{m}\right]=\boldsymbol{S} \boldsymbol{D}, \quad \boldsymbol{S}^{2}=\boldsymbol{S}^{T} \boldsymbol{S}=\frac{1}{2 h} \boldsymbol{I} .$
lyche-numerical-linear-algebra_EQ0708	253	1.000	x_{j, k}=4 h^{4} g_{j, k} /\left(\lambda_{j}+\lambda_{k} \right)=h^{4} g_{j, k} /\left(\sigma_{j}+\sigma_{k} \right), \quad \sigma_{j}:=\lambda_{j} / 4=\sin ^{2}(j \pi h / 2) .	$x_{j, k}=4 h^{4} g_{j, k} /\left(\lambda_{j}+\lambda_{k} \right)=h^{4} g_{j, k} /\left(\sigma_{j}+\sigma_{k} \right), \quad \sigma_{j}:=\lambda_{j} / 4=\sin ^{2}(j \pi h / 2) .$	$x_{j, k}=4 h^{4} g_{j, k} /\left(\lambda_{j}+\lambda_{k} \right)=h^{4} g_{j, k} /\left(\sigma_{j}+\sigma_{k} \right), \quad \sigma_{j}:=\lambda_{j} / 4=\sin ^{2}(j \pi h / 2) .$
lyche-numerical-linear-algebra_EQ0710	255	1.000	w_{j}=\sum_{k=1}^{m} \sin \left(\frac{j k \pi}{m+1} \right) v_{k}, \quad j=1, \ldots, m	$w_{j}=\sum_{k=1}^{m} \sin \left(\frac{j k \pi}{m+1} \right) v_{k}, \quad j=1, \ldots, m$	$w_{j}=\sum_{k=1}^{m} \sin \left(\frac{j k \pi}{m+1} \right) v_{k}, \quad j=1, \ldots, m$
lyche-numerical-linear-algebra_EQ0711 (11.5)	255	1.000	\omega_{N}=\exp ^{-2 \pi i / N}=\cos (2 \pi / N)-i \sin (2 \pi / N),	$\omega_{N}=\exp ^{-2 \pi i / N}=\cos (2 \pi / N)-i \sin (2 \pi / N),$	$\omega_{N}=\exp ^{-2 \pi i / N}=\cos (2 \pi / N)-i \sin (2 \pi / N),$
lyche-numerical-linear-algebra_EQ0712	256	1.000	z_{j+1}=\sum_{k=0}^{N-1} \omega_{N}^{j k} y_{k+1}, \quad j=0, \ldots, N-1,	$z_{j+1}=\sum_{k=0}^{N-1} \omega_{N}^{j k} y_{k+1}, \quad j=0, \ldots, N-1,$	$z_{j+1}=\sum_{k=0}^{N-1} \omega_{N}^{j k} y_{k+1}, \quad j=0, \ldots, N-1,$
lyche-numerical-linear-algebra_EQ0713	256	1.000	\omega_{4}=\exp ^{-2 \pi i / 4}=\cos (\pi / 2)-i \sin (\pi / 2)=-i	$\omega_{4}=\exp ^{-2 \pi i / 4}=\cos (\pi / 2)-i \sin (\pi / 2)=-i$	$\omega_{4}=\exp ^{-2 \pi i / 4}=\cos (\pi / 2)-i \sin (\pi / 2)=-i$
lyche-numerical-linear-algebra_EQ0715	256	1.000	\sin w=\frac{e^{i w}-e^{-i w}}{2 i} .	$\sin w=\frac{e^{i w}-e^{-i w}}{2 i} .$	$\sin w=\frac{e^{i w}-e^{-i w}}{2 i} .$
lyche-numerical-linear-algebra_EQ0716	256	1.000	\boldsymbol{z}^{T}=\left[0, \boldsymbol{x}^{T}, 0,-\boldsymbol{x}_{B}^{T}\right] \in \mathbb{R}^{2 m+2}, \quad \boldsymbol{x}_{B}^{T}:=\left[x_{m}, \ldots, x_{2}, x_{1}\right] .	$\boldsymbol{z}^{T}=\left[0, \boldsymbol{x}^{T}, 0,-\boldsymbol{x}_{B}^{T}\right] \in \mathbb{R}^{2 m+2}, \quad \boldsymbol{x}_{B}^{T}:=\left[x_{m}, \ldots, x_{2}, x_{1}\right] .$	$\boldsymbol{z}^{T}=\left[0, \boldsymbol{x}^{T}, 0,-\boldsymbol{x}_{B}^{T}\right] \in \mathbb{R}^{2 m+2}, \quad \boldsymbol{x}_{B}^{T}:=\left[x_{m}, \ldots, x_{2}, x_{1}\right] .$
lyche-numerical-linear-algebra_EQ0718	256	1.000	\omega^{j k}=e^{-\pi i j k /(m+1)}, \quad \omega^{(2 m+2-j) k}=e^{-2 \pi i} e^{\pi i j k /(m+1)}=e^{\pi i j k /(m+1)} .	$\omega^{j k}=e^{-\pi i j k /(m+1)}, \quad \omega^{(2 m+2-j) k}=e^{-2 \pi i} e^{\pi i j k /(m+1)}=e^{\pi i j k /(m+1)} .$	$\omega^{j k}=e^{-\pi i j k /(m+1)}, \quad \omega^{(2 m+2-j) k}=e^{-2 \pi i} e^{\pi i j k /(m+1)}=e^{\pi i j k /(m+1)} .$
lyche-numerical-linear-algebra_EQ0720	257	1.000	\boldsymbol{P}_{N}=\left[\boldsymbol{e}_{1}, \boldsymbol{e}_{3}, \ldots, \boldsymbol{e}_{N-1}, \boldsymbol{e}_{2}, \boldsymbol{e}_{4}, \ldots, \boldsymbol{e}_{N}\right],	$\boldsymbol{P}_{N}=\left[\boldsymbol{e}_{1}, \boldsymbol{e}_{3}, \ldots, \boldsymbol{e}_{N-1}, \boldsymbol{e}_{2}, \boldsymbol{e}_{4}, \ldots, \boldsymbol{e}_{N}\right],$	$\boldsymbol{P}_{N}=\left[\boldsymbol{e}_{1}, \boldsymbol{e}_{3}, \ldots, \boldsymbol{e}_{N-1}, \boldsymbol{e}_{2}, \boldsymbol{e}_{4}, \ldots, \boldsymbol{e}_{N}\right],$
lyche-numerical-linear-algebra_EQ0724	258	1.000	\boldsymbol{F}_{2}=\left[\begin{array}{rr} 1 & 1 \\ 1 & -1 \end{array}\right], \quad \boldsymbol{D}_{2} \boldsymbol{F}_{2}=\left[\begin{array}{rr} 1 & 1 \\ -i & i \end{array}\right],	$\boldsymbol{F}_{2}=\left[\begin{array}{rr} 1 & 1 \\ 1 & -1 \end{array}\right], \quad \boldsymbol{D}_{2} \boldsymbol{F}_{2}=\left[\begin{array}{rr} 1 & 1 \\ -i & i \end{array}\right],$	$\boldsymbol{F}_{2}=\left[\begin{array}{rr} 1 & 1 \\ 1 & -1 \end{array}\right], \quad \boldsymbol{D}_{2} \boldsymbol{F}_{2}=\left[\begin{array}{rr} 1 & 1 \\ -i & i \end{array}\right],$

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lyche-numerical-linear-algebra_EQ0727 (11.8)	258	■1.000	`\boldsymbol{D}_{m}=\operatorname{diag}\left(1, \omega_{N}, \omega_{N}^{2}, \ldots, \omega_{N}^{m-1} \right) .`	$\boldsymbol{D}_{m}=\operatorname{diag}\left(1, \omega_{N}, \omega_{N}^{2}, \ldots, \omega_{N}^{m-1} \right) .$	$\boldsymbol{D}_{m}=\operatorname{diag}(1, \omega_{N}, \omega_{N}^{2}, \ldots, \omega_{N}^{m-1}).$
lyche-numerical-linear-algebra_EQ0728	258	■1.000	`\omega_{m}^{m}=1, \omega_{2 m}^{2 k}=\omega_{m}^{k}, \omega_{2 m}^{m}=-1,\left(\boldsymbol{F}_{m}\right)_{p, q}=\omega_{m}^{j k},\left(\boldsymbol{D}_{m} \boldsymbol{F}_{m}\right)_{p, q}=\omega_{2 m}^{j} \omega_{m}^{j k},`	$\omega_{m}^{m}=1, \omega_{2 m}^{2 k}=\omega_{m}^{k}, \omega_{2 m}^{m}=-1,\left(\boldsymbol{F}_{m}\right)_{p, q}=\omega_{m}^{j k},\left(\boldsymbol{D}_{m} \boldsymbol{F}_{m}\right)_{p, q}=\omega_{2 m}^{j} \omega_{m}^{j k},$	$\omega_{m}^{m}=1,\ \omega_{2 m}^{2 k}=\omega_{m}^{k},\ \omega_{2 m}^{m}=-1,\ \left(\boldsymbol{F}_{m}\right)_{p, q}=\omega_{m}^{j k},\ \left(\boldsymbol{D}_{m} \boldsymbol{F}_{m}\right)_{p, q}=\omega_{2 m}^{j} \omega_{m}^{j k},$
lyche-numerical-linear-algebra_EQ0730	258	■1.000	`\boldsymbol{w}_{1}^{T}=\left[y_{1}, y_{3}, \ldots, y_{2 m-1}\right], \quad \boldsymbol{w}_{2}^{T}=\left[y_{2}, y_{4}, \ldots, y_{2 m}\right] .`	$\boldsymbol{w}_{1}^{T}=\left[y_{1}, y_{3}, \ldots, y_{2 m-1}\right], \quad \boldsymbol{w}_{2}^{T}=\left[y_{2}, y_{4}, \ldots, y_{2 m}\right] .$	$\boldsymbol{w}_{1}^{T}=\left[y_{1}, y_{3}, \ldots, y_{2 m-1}\right], \quad \boldsymbol{w}_{2}^{T}=\left[y_{2}, y_{4}, \ldots, y_{2 m}\right].$
lyche-numerical-linear-algebra_EQ0732	259	■1.000	`\boldsymbol{q}_{1}=\boldsymbol{F}_{m} \boldsymbol{w}_{1}, \quad \text { and } \quad \boldsymbol{q}_{2}= \boldsymbol{D}_{m}\left(\boldsymbol{F}_{m} \boldsymbol{w}_{2}\right) .`	$\boldsymbol{q}_{1}=\boldsymbol{F}_{m} \boldsymbol{w}_{1}, \quad \text { and } \quad \boldsymbol{q}_{2}=\boldsymbol{D}_{m}\left(\boldsymbol{F}_{m} \boldsymbol{w}_{2}\right) .$	$\boldsymbol{q}_{1}=\boldsymbol{F}_{m} \boldsymbol{w}_{1}, \quad \text { and } \quad \boldsymbol{q}_{2}=\boldsymbol{D}_{m}\left(\boldsymbol{F}_{m} \boldsymbol{w}_{2}\right).$
lyche-numerical-linear-algebra_EQ0733	260	■1.000	`\frac{8 N^{2}}{5 N \log _{2} N} \approx 84000 .`	$\frac{8 N^{2}}{5 N \log _{2} N} \approx 84000 .$	$\frac{8 N^{2}}{5 N \log _{2} N} \approx 84000.$
lyche-numerical-linear-algebra_EQ0734	260	■1.000	`8 \gamma m(m+1) \log _{2}(2 m+2) \approx 8 \gamma m^{2} \log _{2} m=4 \gamma n \log _{2} n,`	$8 \gamma m(m+1) \log _{2}(2 m+2) \approx 8 \gamma m^{2} \log _{2} m=4 \gamma n \log _{2} n,$	$8 \gamma m(m+1) \log _{2}(2 m+2) \approx 8 \gamma m^{2} \log _{2} m=4 \gamma n \log _{2} n,$
lyche-numerical-linear-algebra_EQ0735	261	■1.000	`v_{i j}=\frac{1}{(m+1)^{4}} \sum_{p=1}^{m} \sum_{r=1}^{m} \sum_{k=1}^{m} \sum_{l=1}^{m} \frac{\sin \left(\frac{i p \pi}{m+1}\right) \sin \left(\frac{j r \pi}{m+1}\right) \sin \left(\frac{k p \pi}{m+1}\right) \sin \left(\frac{l r \pi}{m+1}\right)}{\left[\sin \left(\frac{p \pi}{2(m+1)}\right)\right]^{2}+\left[\sin \left(\frac{r \pi}{2(m+1)}\right)\right]^{2}} f_{k, l} .`	$v_{i j}=\frac{1}{(m+1)^{4}} \sum_{p=1}^{m} \sum_{r=1}^{m} \sum_{k=1}^{m} \sum_{l=1}^{m} \frac{\sin \left(\frac{i p \pi}{m+1}\right) \sin \left(\frac{j r \pi}{m+1}\right) \sin \left(\frac{k p \pi}{m+1}\right) \sin \left(\frac{l r \pi}{m+1}\right)}{\left[\sin \left(\frac{p \pi}{2(m+1)}\right)\right]^{2}+\left[\sin \left(\frac{r \pi}{2(m+1)}\right)\right]^{2}} f_{k, l} .$	$v_{i j}=\frac{1}{(m+1)^{4}} \sum_{p=1}^{m} \sum_{r=1}^{m} \sum_{k=1}^{m} \sum_{l=1}^{m} \frac{\sin \left(\frac{i p \pi}{m+1}\right) \sin \left(\frac{j r \pi}{m+1}\right) \sin \left(\frac{k p \pi}{m+1}\right) \sin \left(\frac{l r \pi}{m+1}\right)}{\left[\sin \left(\frac{p \pi}{2(m+1)}\right)\right]^{2}+\left[\sin \left(\frac{r \pi}{2(m+1)}\right)\right]^{2}} f_{k, l} .$
lyche-numerical-linear-algebra_EQ0737 (11.9)	261	■1.000	`\left(\boldsymbol{T}+\lambda_{j} \boldsymbol{I}\right) \boldsymbol{x}_{j}=\boldsymbol{c}_{j} \quad j=1, \ldots, m,`	$\left(\boldsymbol{T}+\lambda_{j} \boldsymbol{I}\right) \boldsymbol{x}_{j}=\boldsymbol{c}_{j} \quad j=1, \ldots, m,$	$\left(\boldsymbol{T}+\lambda_{j} \boldsymbol{I}\right) \boldsymbol{x}_{j}=\boldsymbol{c}_{j} \quad j=1, \ldots, m,$
lyche-numerical-linear-algebra_EQ0738	261	■1.000	`\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}-\frac{1}{6} \boldsymbol{T} \boldsymbol{V} \boldsymbol{T}=h^{2} \mu \boldsymbol{F},`	$\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}-\frac{1}{6} \boldsymbol{T} \boldsymbol{V} \boldsymbol{T}=h^{2} \mu \boldsymbol{F},$	$\boldsymbol{T} \boldsymbol{V}+\boldsymbol{V} \boldsymbol{T}-\frac{1}{6} \boldsymbol{T} \boldsymbol{V} \boldsymbol{T}=h^{2} \mu \boldsymbol{F},$
lyche-numerical-linear-algebra_EQ0741	262	■1.000	`\boldsymbol{T}^{2} \boldsymbol{U}+2 \boldsymbol{T} \boldsymbol{U} \boldsymbol{T}+\boldsymbol{U} \boldsymbol{T}^{2}=h^{4} \boldsymbol{F} .`	$\boldsymbol{T}^{2} \boldsymbol{U}+2 \boldsymbol{T} \boldsymbol{U} \boldsymbol{T}+\boldsymbol{U} \boldsymbol{T}^{2}=h^{4} \boldsymbol{F} .$	$\boldsymbol{T}^{2} \boldsymbol{U}+2 \boldsymbol{T} \boldsymbol{U} \boldsymbol{T}+\boldsymbol{U} \boldsymbol{T}^{2}=h^{4} \boldsymbol{F}.$
lyche-numerical-linear-algebra_EQ0742	262	■1.000	`\boldsymbol{D}^{2} \boldsymbol{X}+2 \boldsymbol{D} \boldsymbol{X} \boldsymbol{D}+\boldsymbol{X} \boldsymbol{D}^{2}=4 h^{6} \boldsymbol{G}, \text { where } \boldsymbol{G}=\boldsymbol{S} \boldsymbol{F} \boldsymbol{S},`	$\boldsymbol{D}^{2} \boldsymbol{X}+2 \boldsymbol{D} \boldsymbol{X} \boldsymbol{D}+\boldsymbol{X} \boldsymbol{D}^{2}=4 h^{6} \boldsymbol{G}, \text { where } \boldsymbol{G}=\boldsymbol{S} \boldsymbol{F} \boldsymbol{S},$	$\boldsymbol{D}^{2} \boldsymbol{X}+2 \boldsymbol{D} \boldsymbol{X} \boldsymbol{D}+\boldsymbol{X} \boldsymbol{D}^{2}=4 h^{6} \boldsymbol{G}, \text { where } \boldsymbol{G}=\boldsymbol{S} \boldsymbol{F} \boldsymbol{S},$
lyche-numerical-linear-algebra_EQ0743	262	■1.000	`x_{j, k}=\frac{h^{6} g_{j, k}}{4\left(\sigma_{j}+ \sigma_{k}\right)^{2}}, \text { where } \sigma_{j}= \sin ^{2}((j \pi h) / 2) \text { for } j, k=1,2, \ldots, m .`	$x_{j, k}=\frac{h^{6} g_{j, k}}{4\left(\sigma_{j}+\sigma_{k}\right)^{2}}, \text { where } \sigma_{j}=\sin ^{2}((j \pi h) / 2) \text { for } j, k=1,2, \ldots, m .$	$x_{j, k}=\frac{h^{6} g_{j, k}}{4\left(\sigma_{j}+\sigma_{k}\right)^{2}}, \text { where } \sigma_{j}=\sin ^{2}((j \pi h) / 2) \text { for } j, k=1,2, \ldots, m.$
lyche-numerical-linear-algebra_EQ0744 (12.1)	266	■1.000	`\boldsymbol{x}(i)=\left(-\sum_{j=1}^{i-1} a_{i j} \boldsymbol{x}(j)-\sum_{j=i+1}^{n} a_{i j} \boldsymbol{x}(j)+b_{i}\right) / a_{i i}, \quad i=1,2, \ldots, n .`	$\boldsymbol{x}(i)=\left(-\sum_{j=1}^{i-1} a_{i j} \boldsymbol{x}(j)-\sum_{j=i+1}^{n} a_{i j} \boldsymbol{x}(j)+b_{i}\right) / a_{i i}, \quad i=1,2, \ldots, n .$	$\boldsymbol{x}(i)=\left(-\sum_{j=1}^{i-1} a_{i j} \boldsymbol{x}(j)-\sum_{j=i+1}^{n} a_{i j} \boldsymbol{x}(j)+b_{i}\right) / a_{i i}, \quad i=1,2, \ldots, n.$

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lyche-numerical-linear-algebra_EQ0745 (12.2)	266	1.000	\boldsymbol{x}_{k+1}(i)=\left(-\sum_{j=1}^{i-1} a_{i j} \boldsymbol{x}_{k}(j)-\sum_{j=i+1}^{n} a_{i j} \boldsymbol{x}_{k}(j)+b_{i}\right) / a_{i i}, \text { for } i=1,2, \ldots, n .	$\boldsymbol{x}_{k+1}(i)=\left(-\sum_{j=1}^{i-1} a_{i j} \boldsymbol{x}_{k}(j)-\sum_{j=i+1}^{n} a_{i j} \boldsymbol{x}_{k}(j)+b_{i}\right) / a_{i i}, \text { for } i=1,2, \ldots, n .$	$\boldsymbol{x}_{k+1}(i)=\big(-\sum_{j=1}^{i-1} a_{ij} \boldsymbol{x}_{k}(j)-\sum_{j=i+1}^{n} a_{ij} \boldsymbol{x}_{k}(j)+b_{i}\big) / a_{ii}, \text { for } i=1,2, \ldots, n .$
lyche-numerical-linear-algebra_EQ0746 (12.3)	266	1.000	\boldsymbol{x}_{k+1}(i)=\left(-\sum_{j=1}^{i-1} a_{i j} \boldsymbol{x}_{k+1}(j)-\sum_{j=i+1}^{n} a_{i j} \boldsymbol{x}_{k}(j)+b_{i}\right) / a_{i i}, \text { for } i=1,2, \ldots, n .	$\boldsymbol{x}_{k+1}(i)=\left(-\sum_{j=1}^{i-1} a_{i j} \boldsymbol{x}_{k+1}(j)-\sum_{j=i+1}^{n} a_{i j} \boldsymbol{x}_{k}(j)+b_{i}\right) / a_{i i}, \text { for } i=1,2, \ldots, n .$	$\boldsymbol{x}_{k+1}(i)=\big(-\sum_{j=1}^{i-1} a_{ij} \boldsymbol{x}_{k+1}(j)-\sum_{j=i+1}^{n} a_{ij} \boldsymbol{x}_{k}(j)+b_{i}\big) / a_{ii}, \text { for } i=1,2, \ldots, n .$
lyche-numerical-linear-algebra_EQ0747 (12.4)	266	1.000	\boldsymbol{x}_{k+1}(i)=\omega\left(-\sum_{j=1}^{i-1} a_{i j} \boldsymbol{x}_{k+1}(j)-\sum_{j=i+1}^{n} a_{i j} \boldsymbol{x}_{k}(j)+b_{i}\right) / a_{i i}+(1-\omega) \boldsymbol{x}_{k}(i) .	$\boldsymbol{x}_{k+1}(i)=\omega\left(-\sum_{j=1}^{i-1} a_{i j} \boldsymbol{x}_{k+1}(j)-\sum_{j=i+1}^{n} a_{i j} \boldsymbol{x}_{k}(j)+b_{i}\right) / a_{i i}+(1-\omega) \boldsymbol{x}_{k}(i) .$	$\boldsymbol{x}_{k+1}(i)=\omega\big(-\sum_{j=1}^{i-1} a_{ij} \boldsymbol{x}_{k+1}(j)-\sum_{j=i+1}^{n} a_{ij} \boldsymbol{x}_{k}(j)+b_{i}\big) / a_{ii}+(1-\omega) \boldsymbol{x}_{k}(i) .$
lyche-numerical-linear-algebra_EQ0748 (12.5)	267	1.000	\boldsymbol{x}_{k+1}(i)=\omega\left(-\sum_{j=1}^{i-1} a_{i j} \boldsymbol{x}_{k+1 / 2}(j)-\sum_{j=i+1}^{n} a_{i j} \boldsymbol{x}_{k+1}(j)+b_{i}\right) / a_{i i}+(1-\omega) \boldsymbol{x}_{k+1 / 2}(i)	$\boldsymbol{x}_{k+1}(i)=\omega\left(-\sum_{j=1}^{i-1} a_{i j} \boldsymbol{x}_{k+1 / 2}(j)-\sum_{j=i+1}^{n} a_{i j} \boldsymbol{x}_{k+1}(j)+b_{i}\right) / a_{i i}+(1-\omega) \boldsymbol{x}_{k+1 / 2}(i)$	$\boldsymbol{x}_{k+1}(i)=\omega\big(-\sum_{j=1}^{i-1} a_{ij} \boldsymbol{x}_{k+1/2}(j)-\sum_{j=i+1}^{n} a_{ij} \boldsymbol{x}_{k+1}(j)+b_{i}\big) / a_{ii}+(1-\omega) \boldsymbol{x}_{k+1/2}(i)$
lyche-numerical-linear-algebra_EQ0749	267	1.000	4 \boldsymbol{v}(i, j)-\boldsymbol{v}(i-1, j)-\boldsymbol{v}(i+1, j)-\boldsymbol{v}(i, j-1)-\boldsymbol{v}(i, j+1)=h^{2} f_{i, j}, \quad i, j=1, \ldots, m,	$4 \boldsymbol{v}(i, j)-\boldsymbol{v}(i-1, j)-\boldsymbol{v}(i+1, j)-\boldsymbol{v}(i, j-1)-\boldsymbol{v}(i, j+1)=h^{2} f_{i, j}, \quad i, j=1, \ldots, m,$	$4 \boldsymbol{v}(i, j)-\boldsymbol{v}(i-1, j)-\boldsymbol{v}(i+1, j)-\boldsymbol{v}(i, j-1)-\boldsymbol{v}(i, j+1)=h^{2} f_{i, j}, \quad i, j=1, \ldots, m,$
lyche-numerical-linear-algebra_EQ0750 (12.6)	267	1.000	\boldsymbol{v}(i, j)=\left(\boldsymbol{v}(i-1, j)+\boldsymbol{v}(i+1, j)+\boldsymbol{v}(i, j-1)+v(i, j+1)+e_{i, j}\right) / 4,	$\boldsymbol{v}(i, j)=(\boldsymbol{v}(i-1, j)+\boldsymbol{v}(i+1, j)+\boldsymbol{v}(i, j-1)+v(i, j+1)+e_{i, j}) / 4,$	$\boldsymbol{v}(i, j)=\big(\boldsymbol{v}(i-1, j)+\boldsymbol{v}(i+1, j)+\boldsymbol{v}(i, j-1)+v(i, j+1)+e_{i, j}\big) / 4,$
lyche-numerical-linear-algebra_EQ0755 (12.10)	270	1.000	\boldsymbol{x}_{k+1}:=\boldsymbol{G} \boldsymbol{x}_{k}+\boldsymbol{c}, \quad \boldsymbol{G}=\boldsymbol{I}-\boldsymbol{M}^{-1} \boldsymbol{A}, \quad, \boldsymbol{c}=\boldsymbol{M}^{-1} b .	$\boldsymbol{x}_{k+1}:=\boldsymbol{G} \boldsymbol{x}_{k}+\boldsymbol{c}, \quad \boldsymbol{G}=\boldsymbol{I}-\boldsymbol{M}^{-1} \boldsymbol{A}, \quad, \boldsymbol{c}=\boldsymbol{M}^{-1} b .$	$\boldsymbol{x}_{k+1}:=\boldsymbol{G} \boldsymbol{x}_{k}+\boldsymbol{c}, \quad \boldsymbol{G}=\boldsymbol{I}-\boldsymbol{M}^{-1} \boldsymbol{A}, \quad, \boldsymbol{c}=\boldsymbol{M}^{-1} b .$
lyche-numerical-linear-algebra_EQ0756	270	1.000	\boldsymbol{x}=\lim _{k \rightarrow \infty} \boldsymbol{x}_{k+1}=\lim _{k \rightarrow \infty} \left(\boldsymbol{G} \boldsymbol{x}_{k}+\boldsymbol{c} \right)=\boldsymbol{G} \lim _{k \rightarrow \infty} \boldsymbol{x}_{k}+\boldsymbol{c}=\boldsymbol{G} \boldsymbol{x}+\boldsymbol{c} .	$\boldsymbol{x}=\lim _{k \rightarrow \infty} \boldsymbol{x}_{k+1}=\lim _{k \rightarrow \infty} \left(\boldsymbol{G} \boldsymbol{x}_{k}+\boldsymbol{c} \right)=\boldsymbol{G} \lim _{k \rightarrow \infty} \boldsymbol{x}_{k}+\boldsymbol{c}=\boldsymbol{G} \boldsymbol{x}+\boldsymbol{c} .$	$\boldsymbol{x}=\lim _{k \rightarrow \infty} \boldsymbol{x}_{k+1}=\lim _{k \rightarrow \infty} \left(\boldsymbol{G} \boldsymbol{x}_{k}+\boldsymbol{c} \right)=\boldsymbol{G} \lim _{k \rightarrow \infty} \boldsymbol{x}_{k}+\boldsymbol{c}=\boldsymbol{G} \boldsymbol{x}+\boldsymbol{c} .$
lyche-numerical-linear-algebra_EQ0758 (12.12)	271	1.000	\boldsymbol{M}_{J}=\boldsymbol{D}, \quad \boldsymbol{M}_{1}=\boldsymbol{D}-\boldsymbol{A}_{L}, \quad \boldsymbol{M}_{\omega}=\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{L} .	$\boldsymbol{M}_{J}=\boldsymbol{D}, \quad \boldsymbol{M}_{1}=\boldsymbol{D}-\boldsymbol{A}_{L}, \quad \boldsymbol{M}_{\omega}=\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{L} .$	$\boldsymbol{M}_{J}=\boldsymbol{D}, \quad \boldsymbol{M}_{1}=\boldsymbol{D}-\boldsymbol{A}_{L}, \quad \boldsymbol{M}_{\omega}=\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{L} .$
lyche-numerical-linear-algebra_EQ0759 (12.13)	271	1.000	\boldsymbol{D} \boldsymbol{x}_{k+1}=\omega \left(\boldsymbol{A}_{L} \boldsymbol{x}_{k+1}+\boldsymbol{A}_{R} \boldsymbol{x}_{k}+\boldsymbol{b} \right)+(1-\omega) \boldsymbol{D} \boldsymbol{x}_{k} .	$\boldsymbol{D} \boldsymbol{x}_{k+1}=\omega \left(\boldsymbol{A}_{L} \boldsymbol{x}_{k+1}+\boldsymbol{A}_{R} \boldsymbol{x}_{k}+\boldsymbol{b} \right)+(1-\omega) \boldsymbol{D} \boldsymbol{x}_{k} .$	$\boldsymbol{D} \boldsymbol{x}_{k+1}=\omega \left(\boldsymbol{A}_{L} \boldsymbol{x}_{k+1}+\boldsymbol{A}_{R} \boldsymbol{x}_{k}+\boldsymbol{b} \right)+(1-\omega) \boldsymbol{D} \boldsymbol{x}_{k} .$
lyche-numerical-linear-algebra_EQ0760	271	1.000	\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array} \right]=\left[\begin{array}{l} 1 \\ 1 \end{array}\right]	$\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array} \right]=\left[\begin{array}{l} 1 \\ 1 \end{array}\right]$	$\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array} \right]=\left[\begin{array}{l} 1 \\ 1 \end{array}\right]$

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lyche-numerical-linear-algebra_EQ0761	271	■1.000	\boldsymbol{A}_{L}=\left[\begin{array}{ll} 0 & 0 \\ 1 & 0 \end{array}\right], \quad \boldsymbol{D}=\left[\begin{array}{ll} 2 & 0 \\ 0 & 2 \end{array}\right], \quad \boldsymbol{A}_{R}=\left[\begin{array}{ll} 0 & 1 \\ 0 & 0 \end{array}\right],	$\boldsymbol{A}_{L}=\left[\begin{array}{ll} 0 & 0 \\ 1 & 0 \end{array}\right], \quad \boldsymbol{D}=\left[\begin{array}{ll} 2 & 0 \\ 0 & 2 \end{array}\right], \quad \boldsymbol{A}_{R}=\left[\begin{array}{ll} 0 & 1 \\ 0 & 0 \end{array}\right],$	$\boldsymbol{A}_{L}=\left[\begin{array}{ll} 0 & 0 \\ 1 & 0 \end{array}\right], \quad \boldsymbol{D}=\left[\begin{array}{ll} 2 & 0 \\ 0 & 2 \end{array}\right], \quad \boldsymbol{A}_{R}=\left[\begin{array}{ll} 0 & 1 \\ 0 & 0 \end{array}\right],$
lyche-numerical-linear-algebra_EQ0762	271	■1.000	\boldsymbol{M}_{J}=\boldsymbol{D}=\left[\begin{array}{ll} 2 & 0 \\ 0 & 2 \end{array}\right], \quad \boldsymbol{M}_{ \omega}=\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{L}= \left[\begin{array}{cc} 2 \omega^{-1} & 0 \\ -1 & 2 \omega^{-1} \end{array}\right] .	$\boldsymbol{M}_{J}=\boldsymbol{D}=\left[\begin{array}{ll} 2 & 0 \\ 0 & 2 \end{array}\right], \quad \boldsymbol{M}_{ \omega}=\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{L}= \left[\begin{array}{cc} 2 \omega^{-1} & 0 \\ -1 & 2 \omega^{-1} \end{array}\right] .$	$\boldsymbol{M}_{J}=\boldsymbol{D}=\left[\begin{array}{ll} 2 & 0 \\ 0 & 2 \end{array}\right], \quad \boldsymbol{M}_{ \omega}=\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{L}= \left[\begin{array}{cc} 2 \omega^{-1} & 0 \\ -1 & 2 \omega^{-1} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0764 (12.15)	271	■1.000	\boldsymbol{G}_{J}=\boldsymbol{I}-\boldsymbol{D}^{-1} \boldsymbol{A}=\left[\begin{array}{cc} 0 & 1 / 2 \\ 1 / 2 & 0 \end{array}\right], \quad \boldsymbol{G}_{1}=\left[\begin{array}{ll} 0 & 1 / 2 \\ 0 & 1 / 4 \end{array} \right] .	$\boldsymbol{G}_{J}=\boldsymbol{I}-\boldsymbol{D}^{-1} \boldsymbol{A}=\left[\begin{array}{cc} 0 & 1 / 2 \\ 1 / 2 & 0 \end{array}\right], \quad \boldsymbol{G}_{1}=\left[\begin{array}{ll} 0 & 1 / 2 \\ 0 & 1 / 4 \end{array}\right] .$	$\boldsymbol{G}_{J}=\boldsymbol{I}-\boldsymbol{D}^{-1} \boldsymbol{A}=\left[\begin{array}{cc} 0 & 1 / 2 \\ 1 / 2 & 0 \end{array}\right], \quad \boldsymbol{G}_{1}=\left[\begin{array}{ll} 0 & 1 / 2 \\ 0 & 1 / 4 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0771 (12.18)	273	■1.000	\boldsymbol{x}_{k+1}=\boldsymbol{x}_{k}+\alpha\left(\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k}\right) .	$\boldsymbol{x}_{k+1}=\boldsymbol{x}_{k}+\alpha\left(\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k}\right) .$	$\boldsymbol{x}_{k+1}=\boldsymbol{x}_{k}+\alpha\left(\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k}\right) .$
lyche-numerical-linear-algebra_EQ0773	274	■1.000	\rho_{\alpha}:=\rho(\boldsymbol{I}-\alpha \boldsymbol{A}):=\max _{j}\left|1-\alpha \lambda_{j} \right|= \begin{cases}1-\alpha \lambda_{1}, & \text { if } \alpha \leq 0 \\ 1-\alpha \lambda_{n}, & \text { if } 0<\alpha \leq \alpha_{o} \\ \alpha \lambda_{1}-1, & \text { if } \alpha>\alpha_{o},\end{cases}	$\rho_{\alpha}:=\rho(\boldsymbol{I}-\alpha \boldsymbol{A}):=\max _{j}\left\|1-\alpha \lambda_{j} \right\|= \begin{cases}1-\alpha \lambda_{1}, & \text { if } \alpha \leq 0 \\ 1-\alpha \lambda_{n}, & \text { if } 0<\alpha \leq \alpha_{o} \\ \alpha \lambda_{1}-1, & \text { if } \alpha>\alpha_{o},\end{cases}$	$\rho_{\alpha}:=\rho(\boldsymbol{I}-\alpha \boldsymbol{A}):=\max _{j}\left\|1-\alpha \lambda_{j} \right\|= \begin{cases}1-\alpha \lambda_{1}, & \text { if } \alpha \leq 0 \\ 1-\alpha \lambda_{n}, & \text { if } 0<\alpha \leq \alpha_{o} \\ \alpha \lambda_{1}-1, & \text { if } \alpha>\alpha_{o},\end{cases}$
lyche-numerical-linear-algebra_EQ0774	274	■1.000	\rho_{\alpha_{o}}=\alpha_{o} \lambda_{1}-1=\frac{ \lambda_{1}-\lambda_{n}}{\lambda_{1}+\lambda_{n}}=\frac{ \kappa-1}{\kappa+1}<1 .	$\rho_{\alpha_{o}}=\alpha_{o} \lambda_{1}-1=\frac{ \lambda_{1}-\lambda_{n}}{\lambda_{1}+\lambda_{n}}=\frac{ \kappa-1}{\kappa+1}<1 .$	$\rho_{\alpha_{o}}=\alpha_{o} \lambda_{1}-1=\frac{ \lambda_{1}-\lambda_{n}}{\lambda_{1}+\lambda_{n}}=\frac{ \kappa-1}{\kappa+1}<1 .$
lyche-numerical-linear-algebra_EQ0776 (12.21)	275	■1.000	\boldsymbol{G}_{\omega}=(\boldsymbol{I}-\omega \boldsymbol{L})^{-1}(\omega \boldsymbol{R}+(1-\omega) \boldsymbol{I}) .	$\boldsymbol{G}_{\omega}=(\boldsymbol{I}-\omega \boldsymbol{L})^{-1}(\omega \boldsymbol{R}+(1-\omega) \boldsymbol{I}) .$	$\boldsymbol{G}_{\omega}=(\boldsymbol{I}-\omega \boldsymbol{L})^{-1}(\omega \boldsymbol{R}+(1-\omega) \boldsymbol{I}) .$
lyche-numerical-linear-algebra_EQ0777 (12.22)	275	■1.000	\omega^{-1}(2-\omega)|1-\lambda|^{2} \boldsymbol{x}^{*} \boldsymbol{D} \boldsymbol{x}=\left(1-|\lambda|^{2} \right) \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x},	$\omega^{-1}(2-\omega)\|1-\lambda\|^{2} \boldsymbol{x}^{*} \boldsymbol{D} \boldsymbol{x}=\left(1-\|\lambda\|^{2} \right) \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x},$	$\omega^{-1}(2-\omega)\|1-\lambda\|^{2} \boldsymbol{x}^{*} \boldsymbol{D} \boldsymbol{x}=\left(1-\|\lambda\|^{2} \right) \boldsymbol{x}^{*} \boldsymbol{A} \boldsymbol{x},$
lyche-numerical-linear-algebra_EQ0778	275	■1.000	\boldsymbol{G}_{\omega} \boldsymbol{x}=\left(\boldsymbol{I}-\boldsymbol{M}_{\omega}^{-1} \boldsymbol{A}\right) \boldsymbol{x}=\boldsymbol{x}- \left(\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{ \boldsymbol{L}}\right)^{-1} \boldsymbol{A} \boldsymbol{x}	$\boldsymbol{G}_{\omega} \boldsymbol{x}=\left(\boldsymbol{I}-\boldsymbol{M}_{\omega}^{-1} \boldsymbol{A}\right) \boldsymbol{x}=\boldsymbol{x}- \left(\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{ \boldsymbol{L}}\right)^{-1} \boldsymbol{A} \boldsymbol{x}$	$\boldsymbol{G}_{\omega} \boldsymbol{x}=\left(\boldsymbol{I}-\boldsymbol{M}_{\omega}^{-1} \boldsymbol{A}\right) \boldsymbol{x}=\boldsymbol{x}- \left(\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{ \boldsymbol{L}}\right)^{-1} \boldsymbol{A} \boldsymbol{x}$
lyche-numerical-linear-algebra_EQ0779 (12.23)	276	■1.000	\boldsymbol{A} \boldsymbol{x}=\left(\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{\boldsymbol{L}}\right) \boldsymbol{y}, \quad \boldsymbol{y}:=(1-\lambda) \boldsymbol{x} .	$\boldsymbol{A} \boldsymbol{x}=\left(\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{ \boldsymbol{L}}\right) \boldsymbol{y}, \quad \boldsymbol{y}:=(1-\lambda) \boldsymbol{x} .$	$\boldsymbol{A} \boldsymbol{x}=\left(\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{ \boldsymbol{L}}\right) \boldsymbol{y}, \quad \boldsymbol{y}:=(1-\lambda) \boldsymbol{x} .$
lyche-numerical-linear-algebra_EQ0780 (12.24)	276	■1.000	\boldsymbol{E} \boldsymbol{y}=\lambda \boldsymbol{A} \boldsymbol{x}, \quad \boldsymbol{E}:=\omega^{-1} \boldsymbol{D}+\boldsymbol{A}_{\boldsymbol{R}}- \boldsymbol{D}=\omega^{-1} \boldsymbol{D}- \boldsymbol{A}_{\boldsymbol{L}}-\boldsymbol{A} .	$\boldsymbol{E} \boldsymbol{y}=\lambda \boldsymbol{A} \boldsymbol{x}, \quad \boldsymbol{E}:=\omega^{-1} \boldsymbol{D}+\boldsymbol{A}_{\boldsymbol{R}}- \boldsymbol{D}=\omega^{-1} \boldsymbol{D}- \boldsymbol{A}_{\boldsymbol{L}}-\boldsymbol{A} .$	$\boldsymbol{E} \boldsymbol{y}=\lambda \boldsymbol{A} \boldsymbol{x}, \quad \boldsymbol{E}:=\omega^{-1} \boldsymbol{D}+\boldsymbol{A}_{\boldsymbol{R}}- \boldsymbol{D}=\omega^{-1} \boldsymbol{D}- \boldsymbol{A}_{\boldsymbol{L}}-\boldsymbol{A} .$

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lyche-numerical-linear-algebra_EQ0781	276	1.000	`\boldsymbol{E} \boldsymbol{y}=\left(\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{\boldsymbol{L}}-\boldsymbol{A}\right) \boldsymbol{y}=\boldsymbol{A} \boldsymbol{x}-\boldsymbol{A} \boldsymbol{y}= \boldsymbol{A} \boldsymbol{x}-(1-\lambda) \boldsymbol{A} \boldsymbol{x}=\lambda \boldsymbol{A} \boldsymbol{x} .`	$\boldsymbol{E} \boldsymbol{y}=\left(\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{\boldsymbol{L}}-\boldsymbol{A}\right) \boldsymbol{y}=\boldsymbol{A} \boldsymbol{x}-\boldsymbol{A} \boldsymbol{y}= \boldsymbol{A} \boldsymbol{x}-(1-\lambda) \boldsymbol{A} \boldsymbol{x}=\lambda \boldsymbol{A} \boldsymbol{x} .$	$\boldsymbol{E} \boldsymbol{y}=\left(\omega^{-1} \boldsymbol{D}-\boldsymbol{A}_{\boldsymbol{L}}-\boldsymbol{A}\right) \boldsymbol{y}=\boldsymbol{A} \boldsymbol{x}-\boldsymbol{A} \boldsymbol{y}= \boldsymbol{A} \boldsymbol{x}-(1-\lambda) \boldsymbol{A} \boldsymbol{x}=\lambda \boldsymbol{A} \boldsymbol{x} .$
lyche-numerical-linear-algebra_EQ0784	276	1.000	`\lambda_{j, k}=4-2 \cos (j \pi h)-2 \cos (k \pi h), \quad j, k=1, \ldots, m, h=1 /(m+1) .`	$\lambda_{j, k}=4-2 \cos (j \pi h)-2 \cos (k \pi h), \quad j, k=1, \ldots, m, h=1 /(m+1) .$	$\lambda_{j, k}=4-2 \cos (j \pi h)-2 \cos (k \pi h), \quad j, k=1, \ldots, m, h=1 /(m+1) .$
lyche-numerical-linear-algebra_EQ0785 (12.25)	276	1.000	`\mu_{j, k}=1-\frac{1}{4} \lambda_{j, k}=\frac{1}{2} \cos (j \pi h)+\frac{1}{2} \cos (k \pi h), \quad j, k=1, \ldots, m .`	$\mu_{j, k}=1-\frac{1}{4} \lambda_{j, k}=\frac{1}{2} \cos (j \pi h)+\frac{1}{2} \cos (k \pi h), \quad j, k=1, \ldots, m .$	$\mu_{j, k}=1-\frac{1}{4} \lambda_{j, k}=\frac{1}{2} \cos (j \pi h)+\frac{1}{2} \cos (k \pi h), \quad j, k=1, \ldots, m .$
lyche-numerical-linear-algebra_EQ0786 (12.26)	277	1.000	`\left\\|\boldsymbol{x}_{k}-\boldsymbol{x}\right\\|_{2} \leq\left\\|\boldsymbol{G}_{J}\right\\|_{2}^{k}\left| \boldsymbol{x}_{0}-\boldsymbol{x}\right\\|_{2}=\cos ^{k}( \pi h)\left|\boldsymbol{x}_{0}-\boldsymbol{x}\right \\|_{2}, \quad k=0,1,2, \ldots`	$\left\|\boldsymbol{x}_{k}-\boldsymbol{x}\right\|_{2} \leq\left\|\boldsymbol{G}_{J}\right\|_{2}^{k}\left\|\boldsymbol{x}_{0}-\boldsymbol{x}\right\|_{2}=\cos^{k}(\pi h)\left\|\boldsymbol{x}_{0}-\boldsymbol{x}\right\|_{2}, \quad k=0,1,2, \ldots$	$\left\|\boldsymbol{x}_{k}-\boldsymbol{x}\right\|_{2} \leq\left\|\boldsymbol{G}_{J}\right\|_{2}^{k}\left\|\boldsymbol{x}_{0}-\boldsymbol{x}\right\|_{2}=\cos^{k}(\pi h)\left\|\boldsymbol{x}_{0}-\boldsymbol{x}\right\|_{2}, \quad k=0,1,2, \ldots$
lyche-numerical-linear-algebra_EQ0788 (12.28)	277	1.000	`\omega^{*}:=\frac{2}{1+\sqrt{1-\beta^{2}}}>1 .`	$\omega^{*}:=\frac{2}{1+\sqrt{1-\beta^{2}}}>1 .$	$\omega^{*}:=\frac{2}{1+\sqrt{1-\beta^{2}}}>1 .$
lyche-numerical-linear-algebra_EQ0790 (12.30)	277	1.000	`\omega^{*}=\frac{2}{1+\sin (\pi h)}, \quad \rho\left( \boldsymbol{G}_{\omega^{*}}\right)=\omega^{*}-1=\frac{1- \sin (\pi h)}{1+\sin (\pi h)}, \quad h=\frac{1}{m+1} .`	$\omega^{*}=\frac{2}{1+\sin (\pi h)}, \quad \rho\left(\boldsymbol{G}_{\omega^{*}}\right)=\omega^{*}-1=\frac{1-\sin (\pi h)}{1+\sin (\pi h)}, \quad h=\frac{1}{m+1} .$	$\omega^{*}=\frac{2}{1+\sin (\pi h)}, \quad \rho\left(\boldsymbol{G}_{\omega^{*}}\right)=\omega^{*}-1=\frac{1-\sin (\pi h)}{1+\sin (\pi h)}, \quad h=\frac{1}{m+1} .$
lyche-numerical-linear-algebra_EQ0792 (12.31)	278	1.000	`\tilde{k}:=\frac{s \log (10)}{\eta}`	$\tilde{k}:=\frac{s \log (10)}{\eta}$	$\tilde{k}:=\frac{s \log (10)}{\eta}$
lyche-numerical-linear-algebra_EQ0794	279	1.000	`\tilde{k}_{n}=\frac{2 \log (10) s}{\pi^{2}} n+O \left(n^{-1}\right)=O(n) .`	$\tilde{k}_{n}=\frac{2 \log (10) s}{\pi^{2}} n+O \left(n^{-1}\right)=O(n) .$	$\tilde{k}_{n}=\frac{2 \log (10) s}{\pi^{2}} n+O \left(n^{-1}\right)=O(n) .$
lyche-numerical-linear-algebra_EQ0795	279	1.000	`\tilde{k}_{n}=\frac{\log (10) s}{\pi^{2}} n+O\left(n^{-1} \right)=O(n) .`	$\tilde{k}_{n}=\frac{\log (10) s}{\pi^{2}} n+O\left(n^{-1} \right)=O(n) .$	$\tilde{k}_{n}=\frac{\log (10) s}{\pi^{2}} n+O\left(n^{-1} \right)=O(n) .$
lyche-numerical-linear-algebra_EQ0796	279	1.000	`\tilde{k}_{n}=\frac{\log (10) s}{2 \pi} \sqrt{n}+O \left(n^{-1 / 2}\right)=O(\sqrt{n}) .`	$\tilde{k}_{n}=\frac{\log (10) s}{2 \pi} \sqrt{n}+O \left(n^{-1 / 2}\right)=O(\sqrt{n}) .$	$\tilde{k}_{n}=\frac{\log (10) s}{2 \pi} \sqrt{n}+O \left(n^{-1 / 2}\right)=O(\sqrt{n}) .$
lyche-numerical-linear-algebra_EQ0797 (12.32)	280	1.000	`\left\\|\boldsymbol{x}_{k}-\boldsymbol{x}_{k-1}\right\\| \geq \frac{1-\\|\boldsymbol{G}\\|}{\\|\boldsymbol{G}\\|}\left \\|\boldsymbol{x}_{k}-\boldsymbol{x}\right\\|, \quad k \geq 1 .`	$\left\|\boldsymbol{x}_{k}-\boldsymbol{x}_{k-1}\right\| \geq \frac{1-\|\boldsymbol{G}\|}{\|\boldsymbol{G}\|}\left\|\boldsymbol{x}_{k}-\boldsymbol{x}\right\|, \quad k \geq 1 .$	$\left\|\boldsymbol{x}_{k}-\boldsymbol{x}_{k-1}\right\| \geq \frac{1-\|\boldsymbol{G}\|}{\|\boldsymbol{G}\|}\left\|\boldsymbol{x}_{k}-\boldsymbol{x}\right\|, \quad k \geq 1 .$
lyche-numerical-linear-algebra_EQ0799 (12.33)	280	1.000	`\boldsymbol{x}_{k+1}=\boldsymbol{x}_{k}+ \boldsymbol{M}^{-1} \boldsymbol{r}_{k}, \quad \boldsymbol{r}_{k}=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k} .`	$\boldsymbol{x}_{k+1}=\boldsymbol{x}_{k}+\boldsymbol{M}^{-1} \boldsymbol{r}_{k}, \quad \boldsymbol{r}_{k}=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k} .$	$\boldsymbol{x}_{k+1}=\boldsymbol{x}_{k}+\boldsymbol{M}^{-1} \boldsymbol{r}_{k}, \quad \boldsymbol{r}_{k}=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k} .$
lyche-numerical-linear-algebra_EQ0800	281	1.000	`\lim _{k \rightarrow \infty} \boldsymbol{A}^{k}= \mathbf{0} \Longleftrightarrow \rho(\boldsymbol{A})<1,`	$\lim _{k \rightarrow \infty} \boldsymbol{A}^{k}=\mathbf{0} \Longleftrightarrow \rho(\boldsymbol{A})<1,$	$\lim _{k \rightarrow \infty} \boldsymbol{A}^{k}=\mathbf{0} \Longleftrightarrow \rho(\boldsymbol{A})<1,$
lyche-numerical-linear-algebra_EQ0801	281	1.000	`\boldsymbol{D}_{t} \boldsymbol{R} \boldsymbol{D}_{t}^{-1}=\left[\begin{array}{ccc} \lambda_{1} & t^{-1} r_{12} & t^{-2} r_{13} \\ 0 & \lambda_{2} & t^{-1} r_{23} \\ 0 & 0 & \lambda_{3} \end{array}\right] .`	$\boldsymbol{D}_{t} \boldsymbol{R} \boldsymbol{D}_{t}^{-1}=\left[\begin{array}{ccc} \lambda_{1} & t^{-1} r_{12} & t^{-2} r_{13} \\ 0 & \lambda_{2} & t^{-1} r_{23} \\ 0 & 0 & \lambda_{3} \end{array}\right] .$	$\boldsymbol{D}_{t} \boldsymbol{R} \boldsymbol{D}_{t}^{-1}=\left[\begin{array}{ccc} \lambda_{1} & t^{-1} r_{12} & t^{-2} r_{13} \\ 0 & \lambda_{2} & t^{-1} r_{23} \\ 0 & 0 & \lambda_{3} \end{array}\right] .$

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lyche-numerical-linear-algebra_EQ0803 (12.34)	282	1.000	`\lim _{k \rightarrow \infty}\left|\boldsymbol{A}^{k} \right|^{1 / k}=\rho(\boldsymbol{A}) .`	$\lim\limits_{k\rightarrow \infty}\left\|\boldsymbol{A}^{k}\right\|^{1 / k}=\rho(\boldsymbol{A}) .$	$\lim\limits_{k\rightarrow \infty}\|\boldsymbol{A}^{k}\|^{1 / k}=\rho(\boldsymbol{A}) .$
lyche-numerical-linear-algebra_EQ0804	282	1.000	`\left|\boldsymbol{A}^{k}\right|=\left|(\rho( \boldsymbol{A})+\epsilon)^{k} \boldsymbol{B}^{k} \right|=(\rho(\boldsymbol{A})+\epsilon)^{k}\left |\boldsymbol{B}^{k}\right|<(\rho(\boldsymbol{A})+ \epsilon)^{k} .`	$\left\|\boldsymbol{A}^{k}\right\|=\left\|(\rho(\boldsymbol{A})+\epsilon)^{k} \boldsymbol{B}^{k} \right\|=(\rho(\boldsymbol{A})+\epsilon)^{k}\left \|\boldsymbol{B}^{k}\right\|<(\rho(\boldsymbol{A})+ \epsilon)^{k} .$	$\|\boldsymbol{A}^{k}\|=\|(\rho(\boldsymbol{A})+\epsilon)^{k} \boldsymbol{B}^{k}\|=\left(\rho(\boldsymbol{A})+\epsilon\right)^{k}\|\boldsymbol{B}^{k}\|<\left(\rho(\boldsymbol{A})+\epsilon\right)^{k} .$
lyche-numerical-linear-algebra_EQ0805	282	1.000	`\sum_{k=0}^{\infty} \boldsymbol{B}^{k}`	$\sum\limits_{k=0}^{\infty} \boldsymbol{B}^{k}$	$\sum\limits_{k=0}^{\infty} \boldsymbol{B}^{k}$
lyche-numerical-linear-algebra_EQ0807	283	1.000	`\left|\boldsymbol{S}_{l}-\boldsymbol{S}_{m}\right |=\left|\sum_{k=m+1}^{l} \boldsymbol{B}^{k}\right | \leq \sum_{k=m+1}^{l}|\boldsymbol{B}|^{k} \leq|\boldsymbol{B}|^{m+1} \sum_{k=0}^{\infty}| \boldsymbol{B}|^{k}=\frac{|\boldsymbol{B}|^{m+1}}{1-| \boldsymbol{B}|} .`	$\left\|\boldsymbol{S}_{l}-\boldsymbol{S}_{m}\right\|=\left\|\sum\limits_{k=m+1}^{l} \boldsymbol{B}^{k}\right\| \leq \sum\limits_{k=m+1}^{l}\|\boldsymbol{B}\|^{k} \leq\|\boldsymbol{B}\|^{m+1} \sum\limits_{k=0}^{\infty}\|\boldsymbol{B}\|^{k}=\frac{\|\boldsymbol{B}\|^{m+1}}{1-\|\boldsymbol{B}\|} .$	$\|\boldsymbol{S}_{l}-\boldsymbol{S}_{m}\|=\|\sum\limits_{k=m+1}^{l} \boldsymbol{B}^{k}\| \leq \sum\limits_{k=m+1}^{l}\|\boldsymbol{B}\|^{k} \leq\|\boldsymbol{B}\|^{m+1} \sum\limits_{k=0}^{\infty}\|\boldsymbol{B}\|^{k}=\frac{\|\boldsymbol{B}\|^{m+1}}{1-\|\boldsymbol{B}\|} .$
lyche-numerical-linear-algebra_EQ0808 (12.36)	283	1.000	`\left(\sum_{k=0}^{m} \boldsymbol{B}^{k}\right)( \boldsymbol{I}-\boldsymbol{B})=\boldsymbol{I}+ \boldsymbol{B}+\cdots+\boldsymbol{B}^{m}-\left( \boldsymbol{B}+\cdots+\boldsymbol{B}^{m+1}\right)= \boldsymbol{I}-\boldsymbol{B}^{m+1} .`	$\left(\sum\limits_{k=0}^{m} \boldsymbol{B}^{k}\right)(\boldsymbol{I}-\boldsymbol{B})=\boldsymbol{I}+\boldsymbol{B}+\cdots+\boldsymbol{B}^{m}-\left(\boldsymbol{B}+\cdots+\boldsymbol{B}^{m+1}\right)=\boldsymbol{I}-\boldsymbol{B}^{m+1} .$	$\left(\sum\limits_{k=0}^{m} \boldsymbol{B}^{k}\right)(\boldsymbol{I}-\boldsymbol{B})=\boldsymbol{I}+\boldsymbol{B}+\cdots+\boldsymbol{B}^{m}-(\boldsymbol{B}+\cdots+\boldsymbol{B}^{m+1})=\boldsymbol{I}-\boldsymbol{B}^{m+1} .$
lyche-numerical-linear-algebra_EQ0809 (12.37)	283	1.000	`\frac{1}{4}\left(v_{i-1, j}+v_{i, j-1}+v_{i+1, j}+v_{i, j+1}\right)=\mu v_{i, j}, \quad i, j=1, \ldots, m,`	$\frac{1}{4}\left(v_{i-1, j}+v_{i, j-1}+v_{i+1, j}+v_{i, j+1}\right)=\mu v_{i, j}, \quad i, j=1, \ldots, m,$	$\frac{1}{4}(v_{i-1, j}+v_{i, j-1}+v_{i+1, j}+v_{i, j+1})=\mu v_{i, j}, \quad i, j=1, \ldots, m,$
lyche-numerical-linear-algebra_EQ0810 (12.38)	283	1.000	`(\omega \boldsymbol{R}+\lambda \omega \boldsymbol{L}) \boldsymbol{w}=(\lambda+\omega-1) \boldsymbol{w} .`	$(\omega \boldsymbol{R}+\lambda \omega \boldsymbol{L}) \boldsymbol{w}=(\lambda+\omega-1) \boldsymbol{w} .$	$(\omega \boldsymbol{R}+\lambda \omega \boldsymbol{L}) \boldsymbol{w}=(\lambda+\omega-1) \boldsymbol{w} .$
lyche-numerical-linear-algebra_EQ0811 (12.39)	284	1.000	`\frac{\omega}{4}\left(\lambda w_{i-1, j}+\lambda w_{i, j-1}+w_{i+1, j}+w_{i, j+1}\right)=(\lambda+\omega-1) w_{i, j}`	$\frac{\omega}{4}\left(\lambda w_{i-1, j}+\lambda w_{i, j-1}+w_{i+1, j}+w_{i, j+1}\right)=(\lambda+\omega-1) w_{i, j}$	$\frac{\omega}{4}(\lambda w_{i-1, j}+\lambda w_{i, j-1}+w_{i+1, j}+w_{i, j+1})=(\lambda+\omega-1) w_{i, j},$
lyche-numerical-linear-algebra_EQ0812 (12.40)	284	1.000	`\mu:=\frac{\lambda+\omega-1}{\omega \lambda^{1 / 2}}`	$\mu:=\frac{\lambda+\omega-1}{\omega \lambda^{1 / 2}}$	$\mu:=\frac{\lambda+\omega-1}{\omega \lambda^{1 / 2}}$
lyche-numerical-linear-algebra_EQ0813 (12.41)	284	1.000	`\mu \omega \lambda^{1 / 2}=\lambda+\omega-1`	$\mu \omega \lambda^{1 / 2}=\lambda+\omega-1$	$\mu \omega \lambda^{1 / 2}=\lambda+\omega-1$
lyche-numerical-linear-algebra_EQ0814	284	1.000	`\frac{\omega}{4}\left(v_{i-1, j}+v_{i, j-1}+v_{i+1, j}+v_{i, j+1}\right)=\lambda^{-1 / 2}(\lambda+\omega-1) v_{i, j} .`	$\frac{\omega}{4}\left(v_{i-1, j}+v_{i, j-1}+v_{i+1, j}+v_{i, j+1}\right)=\lambda^{-1 / 2}(\lambda+\omega-1) v_{i, j} .$	$\frac{\omega}{4}(v_{i-1, j}+v_{i, j-1}+v_{i+1, j}+v_{i, j+1})=\lambda^{-1/2}(\lambda+\omega-1) v_{i, j} .$
lyche-numerical-linear-algebra_EQ0817	284	1.000	`\frac{\omega}{4}\left(\lambda w_{i-1, j}+\lambda w_{i, j-1}+w_{i+1, j}+w_{i, j+1}\right)=\omega \mu \lambda^{1 / 2} w_{i, j}`	$\frac{\omega}{4}\left(\lambda w_{i-1, j}+\lambda w_{i, j-1}+w_{i+1, j}+w_{i, j+1}\right)=\omega \mu \lambda^{1 / 2} w_{i, j}$	$\frac{\omega}{4}(\lambda w_{i-1, j}+\lambda w_{i, j-1}+w_{i+1, j}+w_{i, j+1})=\omega \mu \lambda^{1/2} w_{i, j},$
lyche-numerical-linear-algebra_EQ0818 (12.42)	285	1.000	`\lambda(\mu):=\frac{1}{4}\left(\omega \mu \pm \sqrt{( \omega \mu)^{2}-4(\omega-1)}\right)^{2} .`	$\lambda(\mu):=\frac{1}{4}\left(\omega \mu \pm \sqrt{(\omega \mu)^{2}-4(\omega-1)}\right)^{2} .$	$\lambda(\mu):=\frac{1}{4}\left(\omega \mu \pm \sqrt{(\omega \mu)^{2}-4(\omega-1)}\right)^{2} .$
lyche-numerical-linear-algebra_EQ0821 (12.43)	285	1.000	`\omega=\tilde{\omega}(\mu):=2 \frac{1-\sqrt{1-\mu^{2}}}{ \mu^{2}}=\frac{2}{1+\sqrt{1-\mu^{2}}} .`	$\omega=\tilde{\omega}(\mu):=2 \frac{1-\sqrt{1-\mu^{2}}}{\mu^{2}}=\frac{2}{1+\sqrt{1-\mu^{2}}} .$	$\omega=\tilde{\omega}(\mu):=2 \frac{1-\sqrt{1-\mu^{2}}}{\mu^{2}}=\frac{2}{1+\sqrt{1-\mu^{2}}} .$

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lyche-numerical-linear-algebra_EQ0822	285	1.000	`\lambda(\mu)|=\frac{1}{4}\left((\omega \mu)^{2}+4(\omega-1)-(\omega \mu)^{2}\right)=\omega-1, \quad \tilde{\omega}(\mu)<\omega<2 .`	$\|\lambda(\mu)\| = \frac{1}{4}\left((\omega\mu)^2+4(\omega-1)-(\omega\mu)^2\right)=\omega-1, \quad \tilde{\omega}(\mu)<\omega<2.$	$\|\lambda(\mu)\| = \frac{1}{4}\left((\omega\mu)^2+4(\omega-1)-(\omega\mu)^2\right)=\omega-1, \quad \tilde{\omega}(\mu)<\omega<2.$
lyche-numerical-linear-algebra_EQ0823 (12.44)	285	1.000	`\lambda(\mu)=\frac{1}{4}\left(\omega \mu+\sqrt{(\omega \mu)^{2}-4(\omega-1)}\right)^{2}, \quad 0<\omega \leq \tilde{\omega}(\mu) .`	$\lambda(\mu) = \frac{1}{4}\left(\omega\mu+\sqrt{(\omega\mu)^2-4(\omega-1)}\right)^2, \quad 0<\omega\leq\tilde{\omega}(\mu).$	$\lambda(\mu) = \frac{1}{4}\left(\omega\mu+\sqrt{(\omega\mu)^2-4(\omega-1)}\right)^2, \quad 0<\omega\leq\tilde{\omega}(\mu).$
lyche-numerical-linear-algebra_EQ0824	285	1.000	`\frac{d}{d \omega}\left(\omega \beta+\sqrt{(\omega \beta)^{2}-4(\omega-1)}\right)=\frac{\beta \sqrt{(\omega \beta)^{2}-4(\omega-1)}+\omega \beta^{2}-2}{\sqrt{(\omega \beta)^{2}-4(\omega-1)}} .`	$\frac{d}{d\omega}\left(\omega\beta+\sqrt{(\omega\beta)^2-4(\omega-1)}\right)=\frac{\beta\sqrt{(\omega\beta)^2-4(\omega-1)}+\omega\beta^2-2}{\sqrt{(\omega\beta)^2-4(\omega-1)}}.$	$\frac{d}{d\omega}\left(\omega\beta+\sqrt{(\omega\beta)^2-4(\omega-1)}\right)=\frac{\beta\sqrt{(\omega\beta)^2-4(\omega-1)}+\omega\beta^2-2}{\sqrt{(\omega\beta)^2-4(\omega-1)}}.$
lyche-numerical-linear-algebra_EQ0826	286	1.000	`\rho\left(\boldsymbol{G}_{1}\right)=\left|a_{21} a_{12} / a_{11} a_{22}\right| .`	$\rho\left(\boldsymbol{G}_1\right)=\left\|a_{21}a_{12}/a_{11}a_{22}\right\|.$	$\rho\left(\boldsymbol{G}_1\right)=\left\|a_{21}a_{12}/a_{11}a_{22}\right\|.$
lyche-numerical-linear-algebra_EQ0829 (12.45)	287	1.000	`\boldsymbol{M} \boldsymbol{x}_{k+1}=\boldsymbol{N} \boldsymbol{x}_{k}+\boldsymbol{b},`	$\boldsymbol{M}\boldsymbol{x}_{k+1}=\boldsymbol{N}\boldsymbol{x}_k+\boldsymbol{b},$	$\boldsymbol{M}\boldsymbol{x}_{k+1}=\boldsymbol{N}\boldsymbol{x}_k+\boldsymbol{b},$
lyche-numerical-linear-algebra_EQ0832 (12.48)	288	1.000	`x(i)=b(i)-\sum_{j \neq i} a(i, j) x(j)`	$x(i)=b(i)-\sum_{j\neq i}a(i,j)x(j)$	$x(i)=b(i)-\sum_{j\neq i}a(i,j)x(j)$
lyche-numerical-linear-algebra_EQ0838 (13.4)	291	1.000	`Q(x, y):=\frac{1}{2}\left[\begin{array}{ll} x & y \end{array}\right]\left[\begin{array}{cc} 2 & -1 \\ -1 & 2 \end{array}\right]\left[\begin{array}{l} x \\ y \end{array}\right]=x^{2}-x y+y^{2}`	$Q(x,y):=\frac{1}{2}\begin{bmatrix} x & y \end{bmatrix}\begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix}=x^2-xy+y^2$	$Q(x,y):=\frac{1}{2}\begin{bmatrix} x & y \end{bmatrix}\begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix}=x^2-xy+y^2$
lyche-numerical-linear-algebra_EQ0839 (13.5)	291	1.000	`Q(\boldsymbol{y}+\varepsilon \boldsymbol{h})=Q(\boldsymbol{y})-\varepsilon \boldsymbol{h}^{T} r(\boldsymbol{y})+\frac{1}{2} \varepsilon^{2} \boldsymbol{h}^{T} \boldsymbol{A} \boldsymbol{h}, \text { where } r(\boldsymbol{y}):=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{y} .`	$Q(\boldsymbol{y}+\varepsilon\boldsymbol{h})=Q(\boldsymbol{y})-\varepsilon\boldsymbol{h}^T r(\boldsymbol{y})+\frac{1}{2}\varepsilon^2\boldsymbol{h}^T\boldsymbol{A}\boldsymbol{h}, \text{ where } r(\boldsymbol{y}):=\boldsymbol{b}-\boldsymbol{A}\boldsymbol{y}.$	$Q(\boldsymbol{y}+\varepsilon\boldsymbol{h})=Q(\boldsymbol{y})-\varepsilon\boldsymbol{h}^T r(\boldsymbol{y})+\frac{1}{2}\varepsilon^2\boldsymbol{h}^T\boldsymbol{A}\boldsymbol{h}, \text{ where } r(\boldsymbol{y}):=\boldsymbol{b}-\boldsymbol{A}\boldsymbol{y}.$
lyche-numerical-linear-algebra_EQ0841	293	1.000	`Q\left(\boldsymbol{x}_{k+1}\right)=Q\left(\boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k}\right)=\min _{\alpha \in \mathbb{R}} Q\left(\boldsymbol{x}_{k}+\alpha \boldsymbol{p}_{k}\right) .`	$Q\left(\boldsymbol{x}_{k+1}\right)=Q\left(\boldsymbol{x}_k+\alpha_k\boldsymbol{p}_k\right)=\min_{\alpha\in\mathbb{R}}Q\left(\boldsymbol{x}_k+\alpha\boldsymbol{p}_k\right).$	$Q\left(\boldsymbol{x}_{k+1}\right)=Q\left(\boldsymbol{x}_k+\alpha_k\boldsymbol{p}_k\right)=\min_{\alpha\in\mathbb{R}}Q\left(\boldsymbol{x}_k+\alpha\boldsymbol{p}_k\right).$
lyche-numerical-linear-algebra_EQ0842 (13.7)	293	1.000	`\alpha_{k}:=\frac{\boldsymbol{p}_{k}^{T} \boldsymbol{r}_{k}}{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{k}} .`	$\alpha_k:=\frac{\boldsymbol{p}_k^T\boldsymbol{r}_k}{\boldsymbol{p}_k^T\boldsymbol{A}\boldsymbol{p}_k}.$	$\alpha_k:=\frac{\boldsymbol{p}_k^T\boldsymbol{r}_k}{\boldsymbol{p}_k^T\boldsymbol{A}\boldsymbol{p}_k}.$
lyche-numerical-linear-algebra_EQ0843 (13.8)	293	1.000	`\boldsymbol{x}_{k+1}=\boldsymbol{x}_{k}+\left(\frac{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}}{\boldsymbol{r}_{k}^{T} \boldsymbol{A} \boldsymbol{r}_{k}}\right) \boldsymbol{r}_{k} .`	$\boldsymbol{x}_{k+1}=\boldsymbol{x}_k+\left(\frac{\boldsymbol{r}_k^T\boldsymbol{r}_k}{\boldsymbol{r}_k^T\boldsymbol{A}\boldsymbol{r}_k}\right)\boldsymbol{r}_k.$	$\boldsymbol{x}_{k+1}=\boldsymbol{x}_k+\left(\frac{\boldsymbol{r}_k^T\boldsymbol{r}_k}{\boldsymbol{r}_k^T\boldsymbol{A}\boldsymbol{r}_k}\right)\boldsymbol{r}_k.$

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lyche-numerical-linear-algebra_EQ0844 (13.9)	293	1.000	\begin{aligned} \boldsymbol{p}_{k} & =\boldsymbol{r}_{k}, \boldsymbol{t}_{k}=\boldsymbol{A} \boldsymbol{p}_{k}, \\ \alpha_{k} & =\left(\boldsymbol{p}_{k}^{T} \boldsymbol{r}_{k}\right) /\left(\boldsymbol{p}_{k}^{T} \boldsymbol{t}_{k}\right), \\ \boldsymbol{x}_{k+1} & = \boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k}, \\ \boldsymbol{r}_{k+1} & =\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{t}_{k} . \end{aligned}	$\begin{aligned} \boldsymbol{p}_{k} & =\boldsymbol{r}_{k}, \boldsymbol{t}_{k}=\boldsymbol{A} \boldsymbol{p}_{k}, \\ \alpha_{k} & =\left(\boldsymbol{p}_{k}^{T} \boldsymbol{r}_{k}\right) /\left(\boldsymbol{p}_{k}^{T} \boldsymbol{t}_{k}\right), \\ \boldsymbol{x}_{k+1} & = \boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k}, \\ \boldsymbol{r}_{k+1} & =\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{t}_{k} . \end{aligned}$	$\begin{aligned} \boldsymbol{p}_{k} & =\boldsymbol{r}_{k}, \boldsymbol{t}_{k}=\boldsymbol{A} \boldsymbol{p}_{k}, \\ \alpha_{k} & =\left(\boldsymbol{p}_{k}^{T} \boldsymbol{r}_{k}\right) /\left(\boldsymbol{p}_{k}^{T} \boldsymbol{t}_{k}\right), \\ \boldsymbol{x}_{k+1} & = \boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k}, \\ \boldsymbol{r}_{k+1} & =\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{t}_{k} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0845 (13.10)	293	1.000	\boldsymbol{r}_{k+1}=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k+1}=\boldsymbol{b}-\boldsymbol{A} \left(\boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k} \right)=\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{A} \boldsymbol{p}_{k} .	$\boldsymbol{r}_{k+1}=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k+1}=\boldsymbol{b}-\boldsymbol{A} \left(\boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k} \right)=\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{A} \boldsymbol{p}_{k} .$	$\boldsymbol{r}_{k+1}=\boldsymbol{b}-\boldsymbol{A} \boldsymbol{x}_{k+1}=\boldsymbol{b}-\boldsymbol{A} \left(\boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k} \right)=\boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{A} \boldsymbol{p}_{k} .$
lyche-numerical-linear-algebra_EQ0853 (13.17)	296	1.000	\boldsymbol{p}_{k+1}:=\boldsymbol{r}_{k+1}+ \beta_{k} \boldsymbol{p}_{k}, \quad \beta_{k}:= \frac{\boldsymbol{r}_{k+1}^{T} \boldsymbol{r}_{k+1}}{ \boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}} .	$\boldsymbol{p}_{k+1}:=\boldsymbol{r}_{k+1}+ \beta_{k} \boldsymbol{p}_{k}, \quad \beta_{k}:= \frac{\boldsymbol{r}_{k+1}^{T} \boldsymbol{r}_{k+1}}{ \boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}} .$	$\boldsymbol{p}_{k+1}:=\boldsymbol{r}_{k+1}+ \beta_{k} \boldsymbol{p}_{k}, \quad \beta_{k}:= \frac{\boldsymbol{r}_{k+1}^{T} \boldsymbol{r}_{k+1}}{ \boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}} .$
lyche-numerical-linear-algebra_EQ0856	298	1.000	\boldsymbol{A}=\operatorname{tridiag}_{m}(a, d, a) \otimes \boldsymbol{I}_{m}+\boldsymbol{I}_{m} \otimes \operatorname{tridiag}_{m}(a, d, a) \in \mathbb{R}^{ \left(m^{2}\right) \times\left(m^{2}\right)}	$\boldsymbol{A}=\operatorname{tridiag}_{m}(a, d, a) \otimes \boldsymbol{I}_{m}+\boldsymbol{I}_{m} \otimes \operatorname{tridiag}_{m}(a, d, a) \in \mathbb{R}^{ \left(m^{2}\right) \times\left(m^{2}\right)}$	$\boldsymbol{A}=\operatorname{tridiag}_{m}(a, d, a) \otimes \boldsymbol{I}_{m}+\boldsymbol{I}_{m} \otimes \operatorname{tridiag}_{m}(a, d, a) \in \mathbb{R}^{ \left(m^{2}\right) \times\left(m^{2}\right)}.$
lyche-numerical-linear-algebra_EQ0859	300	1.000	\boldsymbol{T}_{2}:=\operatorname{tridiag}_{m}(a, d, a) \otimes \boldsymbol{I}_{m}+\boldsymbol{I}_{m} \otimes \operatorname{tridiag}_{m}(a, d, a) \in \mathbb{R}^{ \left(m^{2}\right) \times\left(m^{2}\right)} .	$\boldsymbol{T}_{2}:=\operatorname{tridiag}_{m}(a, d, a) \otimes \boldsymbol{I}_{m}+\boldsymbol{I}_{m} \otimes \operatorname{tridiag}_{m}(a, d, a) \in \mathbb{R}^{ \left(m^{2}\right) \times\left(m^{2}\right)} .$	$\boldsymbol{T}_{2}:=\operatorname{tridiag}_{m}(a, d, a) \otimes \boldsymbol{I}_{m}+\boldsymbol{I}_{m} \otimes \operatorname{tridiag}_{m}(a, d, a) \in \mathbb{R}^{ \left(m^{2}\right) \times\left(m^{2}\right)} .$
lyche-numerical-linear-algebra_EQ0860 (13.21)	300	1.000	\lambda_{j, k}=2 d+2 a \cos (j \pi h)+2 a \cos (k \pi h), \quad j, k=1, \ldots, m .	$\lambda_{j, k}=2 d+2 a \cos (j \pi h)+2 a \cos (k \pi h), \quad j, k=1, \ldots, m .$	$\lambda_{j, k}=2 d+2 a \cos (j \pi h)+2 a \cos (k \pi h), \quad j, k=1, \ldots, m .$
lyche-numerical-linear-algebra_EQ0864	301	1.000	\mathbb{W}_{0} \subset \mathbb{W}_{1} \subset \mathbb{W}_{2} \subset \cdots \subset \mathbb{W}_{n} \subset \mathbb{R}^{n}	$\mathbb{W}_{0} \subset \mathbb{W}_{1} \subset \mathbb{W}_{2} \subset \cdots \subset \mathbb{W}_{n} \subset \mathbb{R}^{n}$	$\mathbb{W}_{0} \subset \mathbb{W}_{1} \subset \mathbb{W}_{2} \subset \cdots \subset \mathbb{W}_{n} \subset \mathbb{R}^{n}$
lyche-numerical-linear-algebra_EQ0865 (13.22)	301	1.000	\boldsymbol{x}_{k}-\boldsymbol{x}_{0} \in \mathbb{W}_{k}, \quad \boldsymbol{r}_{k}, \boldsymbol{p}_{k} \in \mathbb{W}_{k+1}, \quad k=0,1, \ldots,	$\boldsymbol{x}_{k}-\boldsymbol{x}_{0} \in \mathbb{W}_{k}, \quad \boldsymbol{r}_{k}, \boldsymbol{p}_{k} \in \mathbb{W}_{k+1}, \quad k=0,1, \ldots,$	$\boldsymbol{x}_{k}-\boldsymbol{x}_{0} \in \mathbb{W}_{k}, \quad \boldsymbol{r}_{k}, \boldsymbol{p}_{k} \in \mathbb{W}_{k+1}, \quad k=0,1, \ldots,$
lyche-numerical-linear-algebra_EQ0867 (13.24)	301	1.000	\left|\boldsymbol{x}-\boldsymbol{x}_{k}\right|_{ \boldsymbol{A}}=\min _{\boldsymbol{w} \in \mathbb{W}_{k}} \left|\boldsymbol{x}-\boldsymbol{x}_{0}-\boldsymbol{w} \right|_{\boldsymbol{A}} .	$\left\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\|_{ \boldsymbol{A}}=\min _{\boldsymbol{w} \in \mathbb{W}_{k}} \left\|\boldsymbol{x}-\boldsymbol{x}_{0}-\boldsymbol{w} \right\|_{\boldsymbol{A}} .$	$\left\|\boldsymbol{x}-\boldsymbol{x}_{k}\right\|_{ \boldsymbol{A}}=\min _{\boldsymbol{w} \in \mathbb{W}_{k}} \left\|\boldsymbol{x}-\boldsymbol{x}_{0}-\boldsymbol{w} \right\|_{\boldsymbol{A}} .$
lyche-numerical-linear-algebra_EQ0869 (13.25)	302	1.000	\left|\boldsymbol{x}-\boldsymbol{x}_{0}-\boldsymbol{w} \right|_{\boldsymbol{A}}^{2}=\sum_{j=1}^{n} \frac{ \sigma_{j}^{2}}{\lambda_{j}} Q\left(\lambda_{j} \right)^{2}, \quad Q(t):=1-t P(t) .	$\left\|\boldsymbol{x}-\boldsymbol{x}_{0}-\boldsymbol{w} \right\|_{\boldsymbol{A}}^{2}=\sum_{j=1}^{n} \frac{ \sigma_{j}^{2}}{\lambda_{j}} Q\left(\lambda_{j} \right)^{2}, \quad Q(t):=1-t P(t) .$	$\left\|\boldsymbol{x}-\boldsymbol{x}_{0}-\boldsymbol{w} \right\|_{\boldsymbol{A}}^{2}=\sum_{j=1}^{n} \frac{ \sigma_{j}^{2}}{\lambda_{j}} Q\left(\lambda_{j} \right)^{2}, \quad Q(t):=1-t P(t) .$
lyche-numerical-linear-algebra_EQ0870 (13.26)	302	1.000	\left|\boldsymbol{x}-\boldsymbol{x}_{0}-P(\boldsymbol{A}) \boldsymbol{r}_{0}\right |_{\boldsymbol{A}}^{2}=\boldsymbol{c}^{T} \boldsymbol{A}^{-1} \boldsymbol{c} \text { where } \boldsymbol{c}=(\boldsymbol{I}-\boldsymbol{A} P(\boldsymbol{A})) \boldsymbol{r}_{0}=Q(\boldsymbol{A}) \boldsymbol{r}_{0} .	$\left\|\boldsymbol{x}-\boldsymbol{x}_{0}-P(\boldsymbol{A}) \boldsymbol{r}_{0}\right \|_{\boldsymbol{A}}^{2}=\boldsymbol{c}^{T} \boldsymbol{A}^{-1} \boldsymbol{c} \text { where } \boldsymbol{c}=(\boldsymbol{I}-\boldsymbol{A} P(\boldsymbol{A})) \boldsymbol{r}_{0}=Q(\boldsymbol{A}) \boldsymbol{r}_{0} .$	$\left\|\boldsymbol{x}-\boldsymbol{x}_{0}-P(\boldsymbol{A}) \boldsymbol{r}_{0}\right \|_{\boldsymbol{A}}^{2}=\boldsymbol{c}^{T} \boldsymbol{A}^{-1} \boldsymbol{c} \text { where } \boldsymbol{c}=(\boldsymbol{I}-\boldsymbol{A} P(\boldsymbol{A})) \boldsymbol{r}_{0}=Q(\boldsymbol{A}) \boldsymbol{r}_{0} .$

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lyche-numerical-linear-algebra_EQ0871 (13.27)	302	■1.000	`\boldsymbol{c}=\sum_{j=1}^{n} \sigma_{j} Q\left(\lambda_{j}\right) \boldsymbol{u}_{j}, \quad \boldsymbol{A}^{-1} \boldsymbol{c}=\sum_{i=1}^{n} \sigma_{i} \frac{Q\left(\lambda_{i}\right)}{\lambda_{i}} \boldsymbol{u}_{i} .`	$\boldsymbol{c}=\sum_{j=1}^{n} \sigma_{j} Q\left(\lambda_{j}\right) \boldsymbol{u}_{j}, \quad \boldsymbol{A}^{-1} \boldsymbol{c}=\sum_{i=1}^{n} \sigma_{i} \frac{Q\left(\lambda_{i}\right)}{\lambda_{i}} \boldsymbol{u}_{i} .$	$\boldsymbol{c}=\sum_{j=1}^{n} \sigma_{j} Q\left(\lambda_{j}\right) \boldsymbol{u}_{j}, \quad \boldsymbol{A}^{-1} \boldsymbol{c}=\sum_{i=1}^{n} \sigma_{i} \frac{Q\left(\lambda_{i}\right)}{\lambda_{i}} \boldsymbol{u}_{i} .$
lyche-numerical-linear-algebra_EQ0876	303	■1.000	`e^{2 / x}=e^{2 y}=\sum_{k=0}^{\infty} \frac{(2 y)^{k}}{k!}<-1+2 \sum_{k=0}^{\infty} y^{k}= \frac{1+y}{1-y}=\frac{x+1}{x-1}`	$e^{2 / x}=e^{2 y}=\sum_{k=0}^{\infty} \frac{(2 y)^{k}}{k!}<-1+2 \sum_{k=0}^{\infty} y^{k}= \frac{1+y}{1-y}=\frac{x+1}{x-1}$	$e^{2 / x}=e^{2 y}=\sum_{k=0}^{\infty} \frac{(2 y)^{k}}{k!}<-1+2 \sum_{k=0}^{\infty} y^{k}= \frac{1+y}{1-y}=\frac{x+1}{x-1}$
lyche-numerical-linear-algebra_EQ0877	304	■1.000	`\\|f\\|_{\infty}=\max _{a \leq x \leq b}|f(x)| .`	$\\|f\\|_{\infty}=\max _{a \leq x \leq b}\|f(x)\| .$	$\\|f\\|_{\infty}=\max _{a \leq x \leq b}\|f(x)\| .$
lyche-numerical-linear-algebra_EQ0878	304	■1.000	`\left|Q^{*}\right|_{\infty}=\min _{Q \in \mathcal{S}_{k}}|Q|_{\infty} .`	$\left\\|Q^{*}\right\\|_{\infty}=\min _{Q \in \mathcal{S}_{k}}\|Q\|_{\infty} .$	$\left\\|Q^{*}\right\\|_{\infty}=\min _{Q \in \mathcal{S}_{k}}\|Q\|_{\infty} .$
lyche-numerical-linear-algebra_EQ0879	304	■1.000	`T_{n+1}(t)=2 t T_{n}(t)-T_{n-1}(t), \quad n \geq 1, \quad t \in \mathbb{R},`	$T_{n+1}(t)=2 t T_{n}(t)-T_{n-1}(t), \quad n \geq 1, \quad t \in \mathbb{R},$	$T_{n+1}(t)=2 t T_{n}(t)-T_{n-1}(t), \quad n \geq 1, \quad t \in \mathbb{R},$
lyche-numerical-linear-algebra_EQ0880	304	■1.000	`P_{n+1}(t)+P_{n-1}(t)=\cos (n+1) \phi+\cos (n-1) \phi=2 \cos \phi \cos n \phi=2 t P_{n}(t),`	$P_{n+1}(t)+P_{n-1}(t)=\cos (n+1) \phi+\cos (n-1) \phi=2 \cos \phi \cos n \phi=2 t P_{n}(t),$	$P_{n+1}(t)+P_{n-1}(t)=\cos (n+1) \phi+\cos (n-1) \phi=2 \cos \phi \cos n \phi=2 t P_{n}(t),$
lyche-numerical-linear-algebra_EQ0882	305	■1.000	`z_{1}=t+\sqrt{t^{2}-1}, \quad z_{2}=t-\sqrt{t^{2}-1}= \left(t+\sqrt{t^{2}-1}\right)^{-1} .`	$z_{1}=t+\sqrt{t^{2}-1}, \quad z_{2}=t-\sqrt{t^{2}-1}= \left(t+\sqrt{t^{2}-1}\right)^{-1} .$	$z_{1}=t+\sqrt{t^{2}-1}, \quad z_{2}=t-\sqrt{t^{2}-1}= \left(t+\sqrt{t^{2}-1}\right)^{-1} .$
lyche-numerical-linear-algebra_EQ0883 (13.32)	305	■1.000	`Q^{*}(x)=\frac{T_{k}(u(x))}{T_{k}(u(c))}, \quad u(x)= \frac{b+a-2 x}{b-a} .`	$Q^{*}(x)=\frac{T_{k}(u(x))}{T_{k}(u(c))}, \quad u(x)= \frac{b+a-2 x}{b-a} .$	$Q^{*}(x)=\frac{T_{k}(u(x))}{T_{k}(u(c))}, \quad u(x)= \frac{b+a-2 x}{b-a} .$
lyche-numerical-linear-algebra_EQ0884	305	■1.000	`\sigma_{j}=f\left(\mu_{j-1}\right) f\left(\mu_{j}\right) .`	$\sigma_{j}=f\left(\mu_{j-1}\right) f\left(\mu_{j}\right) .$	$\sigma_{j}=f\left(\mu_{j-1}\right) f\left(\mu_{j}\right) .$
lyche-numerical-linear-algebra_EQ0885	305	■1.000	`Q\left(\mu_{j}\right) \leq\\|Q\\|_{\infty} \leq\left\\|Q^{*}\right\\|_{\infty}=Q^{*}\left(\mu_{j}\right)`	$Q\left(\mu_{j}\right) \leq\\|Q\\|_{\infty} \leq\left\\|Q^{*}\right\\|_{\infty}=Q^{*}\left(\mu_{j}\right)$	$Q\left(\mu_{j}\right) \leq\\|Q\\|_{\infty} \leq\left\\|Q^{*}\right\\|_{\infty}=Q^{*}\left(\mu_{j}\right)$
lyche-numerical-linear-algebra_EQ0886	305	■1.000	`-Q\left(\mu_{j-1}\right) \leq\\|Q\\|_{\infty} \leq\left\\|Q^{*}\right\\|_{\infty}=-Q^{*}\left(\mu_{j-1}\right) .`	$-Q\left(\mu_{j-1}\right) \leq\\|Q\\|_{\infty} \leq\left\\|Q^{*}\right\\|_{\infty}=-Q^{*}\left(\mu_{j-1}\right) .$	$-Q\left(\mu_{j-1}\right) \leq\\|Q\\|_{\infty} \leq\left\\|Q^{*}\right\\|_{\infty}=-Q^{*}\left(\mu_{j-1}\right) .$
lyche-numerical-linear-algebra_EQ0887 (13.33)	306	■1.000	`Q^{*}(x)=T_{k}\left(\frac{b+a-2 x}{b-a}\right) / T_{k}\left(\frac{b+a}{b-a}\right) .`	$Q^{*}(x)=T_{k}\left(\frac{b+a-2 x}{b-a}\right) / T_{k}\left(\frac{b+a}{b-a}\right) .$	$Q^{*}(x)=T_{k}\left(\frac{b+a-2 x}{b-a}\right) / T_{k}\left(\frac{b+a}{b-a}\right) .$
lyche-numerical-linear-algebra_EQ0888 (13.34)	306	■1.000	`\max _{a \leq x \leq b}\left|T_{k}\left(\frac{b+a-2 x}{b-a}\right)\right|=\max _{-1 \leq t \leq 1}\left|T_{k}(t)\right|=1 .`	$\max _{a \leq x \leq b}\left\|T_{k}\left(\frac{b+a-2 x}{b-a}\right)\right\|=\max _{-1 \leq t \leq 1}\left\|T_{k}(t)\right\|=1 .$	$\max _{a \leq x \leq b}\left\|T_{k}\left(\frac{b+a-2 x}{b-a}\right)\right\|=\max _{-1 \leq t \leq 1}\left\|T_{k}(t)\right\|=1 .$
lyche-numerical-linear-algebra_EQ0889	306	■1.000	`t+\sqrt{t^{2}-1}=\frac{\sqrt{\kappa}+1}{\sqrt{\kappa}-1}, \quad \kappa=b / a .`	$t+\sqrt{t^{2}-1}=\frac{\sqrt{\kappa}+1}{\sqrt{\kappa}-1}, \quad \kappa=b / a .$	$t+\sqrt{t^{2}-1}=\frac{\sqrt{\kappa}+1}{\sqrt{\kappa}-1}, \quad \kappa=b / a .$
lyche-numerical-linear-algebra_EQ0890 (13.35)	306	■1.000	`T_{k}\left(\frac{b+a}{b-a}\right)=T_{k}\left(\frac{\kappa+1}{\kappa-1}\right)=\frac{1}{2}\left[\left(\frac{\sqrt{\kappa}+1}{\sqrt{\kappa}-1}\right)^{k}+\left(\frac{\sqrt{\kappa}-1}{\sqrt{\kappa}+1}\right)^{k}\right]`	$T_{k}\left(\frac{b+a}{b-a}\right)=T_{k}\left(\frac{\kappa+1}{\kappa-1}\right)=\frac{1}{2}\left[\left(\frac{\sqrt{\kappa}+1}{\sqrt{\kappa}-1}\right)^{k}+\left(\frac{\sqrt{\kappa}-1}{\sqrt{\kappa}+1}\right)^{k}\right]$	$T_{k}\left(\frac{b+a}{b-a}\right)=T_{k}\left(\frac{\kappa+1}{\kappa-1}\right)=\frac{1}{2}\left[\left(\frac{\sqrt{\kappa}+1}{\sqrt{\kappa}-1}\right)^{k}+\left(\frac{\sqrt{\kappa}-1}{\sqrt{\kappa}+1}\right)^{k}\right]$
lyche-numerical-linear-algebra_EQ0893 (13.38)	307	■1.000	`t_{i}=\frac{c_{i}^{2}}{\sum_{j=1}^{n} c_{j}^{2}} \geq 0, \quad i=1, \ldots, n \text { and } \sum_{i=1}^{n} t_{i}=1 .`	$t_{i}=\frac{c_{i}^{2}}{\sum_{j=1}^{n} c_{j}^{2}} \geq 0, \quad i=1, \ldots, n \text { and } \sum_{i=1}^{n} t_{i}=1 .$	$t_{i}=\frac{c_{i}^{2}}{\sum_{j=1}^{n} c_{j}^{2}} \geq 0, \quad i=1, \ldots, n \text { and } \sum_{i=1}^{n} t_{i}=1 .$

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lyche-numerical-linear-algebra_EQ0894	307	1.000	`\sqrt{a b}=\sqrt{(a c)(b / c)} \leq(a c+b / c) / 2= \frac{1}{2} \sum_{i=1}^{n} t_{i}\left(\lambda_{i} c+1 /\left(\lambda_{i} c\right)\right)=\frac{1}{2} \sum_{i=1}^{n} t_{i} f\left(\lambda_{i} c\right),`	$\sqrt{ab}=\sqrt{(ac)(b/c)} \leq (ac+b/c)/2=\frac{1}{2}\sum_{i=1}^{n} t_i\left(\lambda_i c+1/\left(\lambda_i c\right)\right)=\frac{1}{2}\sum_{i=1}^{n} t_i f\left(\lambda_i c\right),$	$\sqrt{ab}=\sqrt{(ac)(b/c)} \leq (ac+b/c)/2=\frac{1}{2}\sum_{i=1}^{n} t_i\big(\lambda_i c+1/(\lambda_i c)\big)=\frac{1}{2}\sum_{i=1}^{n} t_i f(\lambda_i c),$
lyche-numerical-linear-algebra_EQ0895	307	1.000	`\sqrt{a b} \leq \frac{1}{2} \max _{m c \leq x \leq M c} f(x) .`	$\sqrt{ab} \leq \frac{1}{2} \max _{mc \leq x \leq Mc} f(x).$	$\sqrt{ab} \leq \frac{1}{2} \max_{mc\leq x\leq Mc} f(x).$
lyche-numerical-linear-algebra_EQ0896 (13.39)	307	1.000	`\sqrt{a b} \leq \frac{1}{2} \max \{f(m c), f(M c)\} .`	$\sqrt{ab} \leq \frac{1}{2} \max\{f(mc), f(Mc)\}.$	$\sqrt{ab} \leq \frac{1}{2} \max\{f(mc),\, f(Mc)\}.$
lyche-numerical-linear-algebra_EQ0898	308	1.000	`1=\left(\sum_{i=1}^{n} t_{i}\right)^{2}=\left( \sum_{i=1}^{n}\left(t_{i} \lambda_{i}\right)^{1 / 2} \left(t_{i} / \lambda_{i}\right)^{1 / 2}\right)^{2} \leq\left(\sum_{i=1}^{n} t_{i} \lambda_{i}\right)\left( \sum_{i=1}^{n} t_{i} / \lambda_{i}\right)=a b .`	$1=\left(\sum_{i=1}^{n} t_i\right)^2=\left(\sum_{i=1}^{n}\left(t_i\lambda_i\right)^{1/2}\left(t_i/\lambda_i\right)^{1/2}\right)^2 \leq\left(\sum_{i=1}^{n} t_i\lambda_i\right)\left(\sum_{i=1}^{n} t_i/\lambda_i\right)=ab.$	$1=\big(\sum_{i=1}^{n} t_i\big)^2=\left(\sum_{i=1}^{n}(t_i\lambda_i)^{1/2}(t_i/\lambda_i)^{1/2}\right)^2 \leq\big(\sum_{i=1}^{n} t_i\lambda_i\big)\big(\sum_{i=1}^{n} t_i/\lambda_i\big)=ab.$
lyche-numerical-linear-algebra_EQ0900	308	1.000	`\boldsymbol{\epsilon}_{k+1}=\boldsymbol{\epsilon}_{k}- \alpha_{k} \boldsymbol{r}_{k}, \quad \alpha_{k}:= \frac{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}}{ \boldsymbol{r}_{k}^{T} \boldsymbol{A} \boldsymbol{r}_{k}} .`	$\boldsymbol{\epsilon}_{k+1}=\boldsymbol{\epsilon}_k-\alpha_k\boldsymbol{r}_k, \quad \alpha_k:=\frac{\boldsymbol{r}_k^T\boldsymbol{r}_k}{\boldsymbol{r}_k^T\boldsymbol{A}\boldsymbol{r}_k}.$	$\boldsymbol{\epsilon}_{k+1}=\boldsymbol{\epsilon}_k-\alpha_k\boldsymbol{r}_k, \quad \alpha_k:=\frac{\boldsymbol{r}_k^T\boldsymbol{r}_k}{\boldsymbol{r}_k^T\boldsymbol{A}\boldsymbol{r}_k}.$
lyche-numerical-linear-algebra_EQ0902	308	1.000	`\frac{\left\\|\boldsymbol{\epsilon}_{k+1}\right \\|_{\boldsymbol{A}}^{2}}{\left\\|\boldsymbol{ \epsilon}_{k}\right\\|_{\boldsymbol{A}}^{2}}=1-\frac{ \left(\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k} \right)^{2}}{\left(\boldsymbol{r}_{k}^{T} \boldsymbol{A} \boldsymbol{r}_{k}\right)\left(\boldsymbol{r}_{k}^{T} \boldsymbol{A}^{-1} \boldsymbol{r}_{k}\right)} \leq 1- \frac{4 \lambda_{\min } \lambda_{\max }}{\left(\lambda_{ \min }+\lambda_{\max }\right)^{2}}=\left(\frac{\kappa-1}{ \kappa+1}\right)^{2}`	$\frac{\left\\|\boldsymbol{\epsilon}_{k+1}\right\\|_{\boldsymbol{A}}^2}{\left\\|\boldsymbol{\epsilon}_k\right\\|_{\boldsymbol{A}}^2}=1-\frac{\left(\boldsymbol{r}_k^T\boldsymbol{r}_k\right)^2}{\left(\boldsymbol{r}_k^T\boldsymbol{A}\boldsymbol{r}_k\right)\left(\boldsymbol{r}_k^T\boldsymbol{A}^{-1}\boldsymbol{r}_k\right)} \leq 1-\frac{4\lambda_{\min}\lambda_{\max}}{\left(\lambda_{\min}+\lambda_{\max}\right)^2}=\left(\frac{\kappa-1}{\kappa+1}\right)^2$	$\frac{\left\\|\boldsymbol{\epsilon}_{k+1}\right\\|_{\boldsymbol{A}}^2}{\left\\|\boldsymbol{\epsilon}_k\right\\|_{\boldsymbol{A}}^2}=1-\frac{(\boldsymbol{r}_k^T\boldsymbol{r}_k)^2}{(\boldsymbol{r}_k^T\boldsymbol{A}\boldsymbol{r}_k)(\boldsymbol{r}_k^T\boldsymbol{A}^{-1}\boldsymbol{r}_k)} \leq 1-\frac{4\lambda_{min}\lambda_{max}}{(\lambda_{min}+\lambda_{max})^2}=\left(\frac{\kappa-1}{\kappa+1}\right)^2$
lyche-numerical-linear-algebra_EQ0905 (13.41)	309	1.000	`\boldsymbol{\epsilon}_{j}=\sum_{i=j}^{m} \alpha_{i} \boldsymbol{p}_{i}, \quad \alpha_{i}=\frac{ \boldsymbol{r}_{i}^{T} \boldsymbol{r}_{i}}{ \boldsymbol{p}_{i}^{T} \boldsymbol{A} \boldsymbol{p}_{i}} .`	$\boldsymbol{\epsilon}_j=\sum_{i=j}^{m}\alpha_i\boldsymbol{p}_i, \quad \alpha_i=\frac{\boldsymbol{r}_i^T\boldsymbol{r}_i}{\boldsymbol{p}_i^T\boldsymbol{A}\boldsymbol{p}_i}.$	$\boldsymbol{\epsilon}_j=\sum_{i=j}^{m}\alpha_i\boldsymbol{p}_i, \quad \alpha_i=\frac{\boldsymbol{r}_i^T\boldsymbol{r}_i}{\boldsymbol{p}_i^T\boldsymbol{A}\boldsymbol{p}_i}.$
lyche-numerical-linear-algebra_EQ0906 (13.42)	309	1.000	`\left\\|\boldsymbol{\epsilon}_{j}\right\\|_{ \boldsymbol{A}}^{2}=\boldsymbol{\epsilon}_{j} \boldsymbol{A} \boldsymbol{\epsilon}_{j}=\sum_{i=j}^{m} \alpha_{i}^{2} \boldsymbol{p}_{i}^{T} \boldsymbol{A} \boldsymbol{p}_{i}=\sum_{i=j}^{m} \frac{\left(\boldsymbol{r}_{i}^{T} \boldsymbol{r}_{i}\right)^{2}}{ \boldsymbol{p}_{i}^{T} \boldsymbol{A} \boldsymbol{p}_{i}} .`	$\left\\|\boldsymbol{\epsilon}_j\right\\|_{\boldsymbol{A}}^2=\boldsymbol{\epsilon}_j\boldsymbol{A}\boldsymbol{\epsilon}_j=\sum_{i=j}^{m}\alpha_i^2\boldsymbol{p}_i^T\boldsymbol{A}\boldsymbol{p}_i=\sum_{i=j}^{m}\frac{\left(\boldsymbol{r}_i^T\boldsymbol{r}_i\right)^2}{\boldsymbol{p}_i^T\boldsymbol{A}\boldsymbol{p}_i}.$	$\left\\|\boldsymbol{\epsilon}_j\right\\|_{\boldsymbol{A}}^2=\boldsymbol{\epsilon}_j\boldsymbol{A}\boldsymbol{\epsilon}_j=\sum_{i=j}^{m}\alpha_i^2\boldsymbol{p}_i^T\boldsymbol{A}\boldsymbol{p}_i=\sum_{i=j}^{m}\frac{(\boldsymbol{r}_i^T\boldsymbol{r}_i)^2}{\boldsymbol{p}_i^T\boldsymbol{A}\boldsymbol{p}_i}.$

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lyche-numerical-linear-algebra_EQ0907	309	1.000	\boldsymbol{p}_{i}^{T} \boldsymbol{p}_{k}=\left(\boldsymbol{r}_{i}+\beta_{i-1} \boldsymbol{p}_{i-1} \right)^{T} \boldsymbol{p}_{k}=\beta_{i-1} \boldsymbol{p}_{i-1}^{T} \boldsymbol{p}_{k}=\cdots= \beta_{i-1} \cdots \beta_{k}\left(\boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k}\right),	$\boldsymbol{p}_{i}^{T} \boldsymbol{p}_{k}=\left(\boldsymbol{r}_{i}+\beta_{i-1} \boldsymbol{p}_{i-1}\right)^{T} \boldsymbol{p}_{k}=\beta_{i-1} \boldsymbol{p}_{i-1}^{T} \boldsymbol{p}_{k}=\cdots=\beta_{i-1} \cdots \beta_{k}\left(\boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k}\right),$	$\boldsymbol{p}_{i}^{T} \boldsymbol{p}_{k}=\left(\boldsymbol{r}_{i}+\beta_{i-1} \boldsymbol{p}_{i-1}\right)^{T} \boldsymbol{p}_{k}=\beta_{i-1} \boldsymbol{p}_{i-1}^{T} \boldsymbol{p}_{k}=\cdots=\beta_{i-1} \cdots \beta_{k}(\boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k}),$
lyche-numerical-linear-algebra_EQ0908 (13.43)	309	1.000	\boldsymbol{p}_{i}^{T} \boldsymbol{p}_{k}=\frac{ \boldsymbol{r}_{i}^{T} \boldsymbol{r}_{i}}{ \boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}} \boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k}, \quad i \geq k	$\boldsymbol{p}_{i}^{T} \boldsymbol{p}_{k}=\frac{\boldsymbol{r}_{i}^{T} \boldsymbol{r}_{i}}{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}} \boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k}, \quad i \geq k$	$\boldsymbol{p}_{i}^{T} \boldsymbol{p}_{k}=\frac{\boldsymbol{r}_{i}^{T} \boldsymbol{r}_{i}}{\boldsymbol{r}_{k}^{T} \boldsymbol{r}_{k}} \boldsymbol{p}_{k}^{T} \boldsymbol{p}_{k}, \quad i \geq k.$
lyche-numerical-linear-algebra_EQ0909	309	1.000	\left|\boldsymbol{\epsilon}_{k}\right|_{2}^{2}=\left |\boldsymbol{\epsilon}_{k+1}+\boldsymbol{x}_{k+1}- \boldsymbol{x}_{k}\right|_{2}^{2}=\left|\boldsymbol{ \epsilon}_{k+1}+\alpha_{k} \boldsymbol{p}_{k}\right |_{2}^{2},	$\left\|\boldsymbol{\epsilon}_{k}\right\|_{2}^{2}=\left\|\boldsymbol{\epsilon}_{k+1}+\boldsymbol{x}_{k+1}-\boldsymbol{x}_{k}\right\|_{2}^{2}=\left\|\boldsymbol{\epsilon}_{k+1}+\alpha_{k} \boldsymbol{p}_{k}\right\|_{2}^{2},$	$\left\|\boldsymbol{\epsilon}_{k}\right\|_{2}^{2}=\left\|\boldsymbol{\epsilon}_{k+1}+\boldsymbol{x}_{k+1}-\boldsymbol{x}_{k}\right\|_{2}^{2}=\left\|\boldsymbol{\epsilon}_{k+1}+\alpha_{k} \boldsymbol{p}_{k}\right\|_{2}^{2},$
lyche-numerical-linear-algebra_EQ0913 (13.49)	311	1.000	\boldsymbol{C}^{T}\left(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}\right) \boldsymbol{C}^{-T}= \boldsymbol{B} \boldsymbol{A} .	$\boldsymbol{C}^{T}\left(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T}\right) \boldsymbol{C}^{-T}=\boldsymbol{B} \boldsymbol{A}.$	$\boldsymbol{C}^{T}(\boldsymbol{C} \boldsymbol{A} \boldsymbol{C}^{T})\boldsymbol{C}^{-T}=\boldsymbol{B} \boldsymbol{A}.$
lyche-numerical-linear-algebra_EQ0916 (13.50)	311	1.000	\begin{aligned} & \boldsymbol{x}_{k+1}= \boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k}, \quad \alpha_{k}=\frac{\boldsymbol{s}_{k}^{T} \boldsymbol{r}_{k}}{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{k}}, \\ & \boldsymbol{r}_{k+1}= \boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{A} \boldsymbol{p}_{k}, \\ & \boldsymbol{s}_{k+1}= \boldsymbol{s}_{k}-\alpha_{k} \boldsymbol{B} \boldsymbol{A} \boldsymbol{p}_{k}, \\ & \boldsymbol{p}_{k+1}=\boldsymbol{s}_{k+1}+\beta_{k} \boldsymbol{p}_{k}, \quad \beta_{k}=\frac{\boldsymbol{s}_{k+1}^{T} \boldsymbol{r}_{k+1}}{\boldsymbol{s}_{k}^{T} \boldsymbol{r}_{k}} . \end{aligned}	$\begin{aligned} & \boldsymbol{x}_{k+1}= \boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k}, \quad \alpha_{k}=\frac{\boldsymbol{s}_{k}^{T} \boldsymbol{r}_{k}}{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{k}}, \\ & \boldsymbol{r}_{k+1}= \boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{A} \boldsymbol{p}_{k}, \\ & \boldsymbol{s}_{k+1}= \boldsymbol{s}_{k}-\alpha_{k} \boldsymbol{B} \boldsymbol{A} \boldsymbol{p}_{k}, \\ & \boldsymbol{p}_{k+1}=\boldsymbol{s}_{k+1}+\beta_{k} \boldsymbol{p}_{k}, \quad \beta_{k}=\frac{\boldsymbol{s}_{k+1}^{T} \boldsymbol{r}_{k+1}}{\boldsymbol{s}_{k}^{T} \boldsymbol{r}_{k}} . \end{aligned}$	$\begin{aligned} & \boldsymbol{x}_{k+1}= \boldsymbol{x}_{k}+\alpha_{k} \boldsymbol{p}_{k}, \quad \alpha_{k}=\frac{\boldsymbol{s}_{k}^{T} \boldsymbol{r}_{k}}{\boldsymbol{p}_{k}^{T} \boldsymbol{A} \boldsymbol{p}_{k}}, \\ & \boldsymbol{r}_{k+1}= \boldsymbol{r}_{k}-\alpha_{k} \boldsymbol{A} \boldsymbol{p}_{k}, \\ & \boldsymbol{s}_{k+1}= \boldsymbol{s}_{k}-\alpha_{k} \boldsymbol{B} \boldsymbol{A} \boldsymbol{p}_{k}, \\ & \boldsymbol{p}_{k+1}=\boldsymbol{s}_{k+1}+\beta_{k} \boldsymbol{p}_{k}, \quad \beta_{k}=\frac{\boldsymbol{s}_{k+1}^{T} \boldsymbol{r}_{k+1}}{\boldsymbol{s}_{k}^{T} \boldsymbol{r}_{k}} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0921	313	1.000	\begin{aligned} I_{m} & :=\{(j, k): 1 \leq j, k \leq m \}, \\ \bar{I}_{m} & :=\{(j, k): 0 \leq j, k \leq m+1 \}, \\ \partial I_{m} & :=\bar{I}_{m} \backslash I_{m} . \end{aligned}	$\begin{aligned} I_{m} & :=\{(j, k): 1 \leq j, k \leq m\}, \\ \bar{I}_{m} & :=\{(j, k): 0 \leq j, k \leq m+1\}, \\ \partial I_{m} & :=\bar{I}_{m} \backslash I_{m} . \end{aligned}$	$\begin{aligned} I_{m} & :=\{(j, k): 1 \leq j, k \leq m\}, \\ \bar{I}_{m} & :=\{(j, k): 0 \leq j, k \leq m+1\}, \\ \partial I_{m} & :=\bar{I}_{m} \backslash I_{m} . \end{aligned}$
lyche-numerical-linear-algebra_EQ0922	313	1.000	\left\{\left(x_{j}, y_{k}\right)=(j h, k h):(j, k) \in \bar{I}_{m}\right\}	$\left\{\left(x_{j}, y_{k}\right)=(j h, k h):(j, k) \in \bar{I}_{m}\right\}$	$\left\{\left(x_{j}, y_{k}\right)=(j h, k h):(j, k) \in \bar{I}_{m}\right\}$

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lyche-numerical-linear-algebra_EQ0923 (13.54)	314	■ 1.000	`\begin{aligned} \frac{d}{d t}\left(f(t) \frac{d}{d t} g(t)\right) & \approx\left(f\left(t+\frac{h}{2}\right) \frac{d}{d t} g(t+h / 2)-f\left(t-\frac{h}{2}\right) \frac{d}{d t} g\left(t-\frac{h}{2}\right)\right) / h \\ & \approx\left(f\left(t+\frac{h}{2}\right)(g(t+h)-g(t))-f \left(t-\frac{h}{2}\right)(g(t)-g(t-h))\right) / h^{2} \end{aligned}`	$\begin{aligned} \frac{d}{dt}\left(f(t)\frac{d}{dt}g(t)\right) &\approx\left(f\left(t+\frac{h}{2}\right)\frac{d}{dt}g(t+h/2)-f\left(t-\frac{h}{2}\right)\frac{d}{dt}g\left(t-\frac{h}{2}\right)\right)/h \\ &\approx\left(f\left(t+\frac{h}{2}\right)(g(t+h)-g(t))-f\left(t-\frac{h}{2}\right)(g(t)-g(t-h))\right)/h^2 \end{aligned}$	$\begin{aligned} \frac{d}{dt}\left(f(t)\frac{d}{dt}g(t)\right) &\approx\left(f(t+\frac{h}{2})\frac{d}{dt}g(t+h/2)-f(t-\frac{h}{2})\frac{d}{dt}g(t-\frac{h}{2})\right)/h \\ &\approx\left(f(t+\frac{h}{2})\big(g(t+h)-g(t)\big)-f(t-\frac{h}{2})\big(g(t)-g(t-h)\big)\right)/h^2 \end{aligned}$
lyche-numerical-linear-algebra_EQ0927	314	■ 1.000	`\boldsymbol{V}:=\left[\begin{array}{ccc} v_{1,1} & \ldots & v_{1, m} \\ \vdots & & \vdots \\ v_{m, 1} & \ldots & v_{m, m} \end{array}\right]`	$\boldsymbol{V}:=\left[\begin{array}{ccc} v_{1,1} & \ldots & v_{1,m} \\ \vdots & & \vdots \\ v_{m,1} & \ldots & v_{m,m} \end{array}\right]$	$\boldsymbol{V}:=\left[\begin{array}{ccc} v_{1,1} & \ldots & v_{1,m} \\ \vdots & & \vdots \\ v_{m,1} & \ldots & v_{m,m} \end{array}\right]$
lyche-numerical-linear-algebra_EQ0928 (13.57)	314	■ 1.000	`\boldsymbol{A} \boldsymbol{x}=\boldsymbol{A} \operatorname{vec}(\boldsymbol{V}):=h^{2} \operatorname{vec}\left(L_{h} \boldsymbol{v}\right) .`	$\boldsymbol{A}\boldsymbol{x}=\boldsymbol{A}\operatorname{vec}(\boldsymbol{V}):=h^{2}\operatorname{vec}\left(L_{h}\boldsymbol{v}\right) .$	$\boldsymbol{A}\boldsymbol{x}=\boldsymbol{A}\operatorname{vec}(\boldsymbol{V}):=h^{2}\operatorname{vec}(L_{h}v).$
lyche-numerical-linear-algebra_EQ0931 (13.60)	315	■ 1.000	`\sum_{i=1}^{m}\left(a_{i-1}\left(b_{i}-b_{i-1} \right)-a_{i}\left(b_{i+1}-b_{i}\right)\right) c_{i}=\sum_{i=0}^{m} a_{i}\left(b_{i+1}-b_{i}\right) \left(c_{i+1}-c_{i}\right) .`	$\sum_{i=1}^{m}\left(a_{i-1}\left(b_{i}-b_{i-1}\right)-a_{i}\left(b_{i+1}-b_{i}\right)\right) c_{i}=\sum_{i=0}^{m} a_{i}\left(b_{i+1}-b_{i}\right)\left(c_{i+1}-c_{i}\right) .$	$\sum_{i=1}^{m}\big(a_{i-1}(b_{i}-b_{i-1})-a_{i}(b_{i+1}-b_{i})\big)c_{i}=\sum_{i=0}^{m}a_{i}(b_{i+1}-b_{i})(c_{i+1}-c_{i}).$
lyche-numerical-linear-algebra_EQ0932	315	■ 1.000	`\sum_{i=0}^{m} a_{i}\left(b_{i+1}-b_{i}\right) c_{i+1}- \sum_{i=0}^{m} a_{i}\left(b_{i+1}-b_{i}\right) c_{i},`	$\sum_{i=0}^{m} a_{i}\left(b_{i+1}-b_{i}\right) c_{i+1}-\sum_{i=0}^{m} a_{i}\left(b_{i+1}-b_{i}\right) c_{i},$	$\sum_{i=0}^{m} a_{i}(b_{i+1}-b_{i})c_{i+1}-\sum_{i=0}^{m} a_{i}(b_{i+1}-b_{i})c_{i},$
lyche-numerical-linear-algebra_EQ0933	316	■ 1.000	`c(x, y)=e^{-x+y} \text { and } f(x, y)=1 .`	$c(x, y)=e^{-x+y} \text{ and } f(x, y)=1 .$	$c(x, y)=e^{-x+y} \text{ and } f(x, y)=1.$
lyche-numerical-linear-algebra_EQ0934	317	■ 1.000	`\kappa=\frac{\lambda_{\max }}{\lambda_{\min }} \leq \frac{c_{1}}{c_{0}} .`	$\kappa=\frac{\lambda_{\max }}{\lambda_{\min }} \leq \frac{c_{1}}{c_{0}} .$	$\kappa=\frac{\lambda_{max}}{\lambda_{min}} \leq \frac{c_{1}}{c_{0}}.$
lyche-numerical-linear-algebra_EQ0936	317	■ 1.000	`\boldsymbol{x}^{T} \boldsymbol{A}_{p} x=\sum_{i=1}^{m} \sum_{j=0}^{m}\left(v_{i, j+1}-v_{i, j}\right)^{2}+ \sum_{j=1}^{m} \sum_{i=0}^{m}\left(v_{i+1, j}-v_{i, j} \right)^{2} .`	$\boldsymbol{x}^{T} \boldsymbol{A}_{p} x=\sum_{i=1}^{m} \sum_{j=0}^{m}\left(v_{i, j+1}-v_{i, j}\right)^{2}+ \sum_{j=1}^{m} \sum_{i=0}^{m}\left(v_{i+1, j}-v_{i, j}\right)^{2} .$	$\boldsymbol{x}^{T} \boldsymbol{A}_{p} x=\sum_{i=1}^{m} \sum_{j=0}^{m}\left(v_{i, j+1}-v_{i, j}\right)^{2}+ \sum_{j=1}^{m} \sum_{i=0}^{m}\left(v_{i+1, j}-v_{i, j}\right)^{2}.$
lyche-numerical-linear-algebra_EQ0938	318	■ 1.000	`Q(\boldsymbol{y})=\frac{1}{2} \sum_{j=1}^{n} \lambda_{j} v_{j}^{2}-\sum_{j=1}^{n} c_{j} v_{j} .`	$Q(\boldsymbol{y})=\frac{1}{2} \sum_{j=1}^{n} \lambda_{j} v_{j}^{2}-\sum_{j=1}^{n} c_{j} v_{j} .$	$Q(\boldsymbol{y})=\frac{1}{2} \sum_{j=1}^{n} \lambda_{j} v_{j}^{2}-\sum_{j=1}^{n} c_{j} v_{j}.$
lyche-numerical-linear-algebra_EQ0939	318	■ 1.000	`\left[\begin{array}{rr} 2 & -1 \\ -1 & 2 \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array} \right]=\left[\begin{array}{l} 0 \\ 3 \end{array}\right]`	$\left[\begin{array}{rr} 2 & -1 \\ -1 & 2 \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array} \right]=\left[\begin{array}{l} 0 \\ 3 \end{array}\right]$	$\left[\begin{array}{rr} 2 & -1 \\ -1 & 2 \end{array} \right]\left[\begin{array}{l} x_{1} \\ x_{2} \end{array} \right]=\left[\begin{array}{l} 0 \\ 3 \end{array}\right]$
lyche-numerical-linear-algebra_EQ0940	319	■ 1.000	`\boldsymbol{w}^{T} \boldsymbol{A}^{T} \boldsymbol{A} \hat{\boldsymbol{x}}=\boldsymbol{w}^{T} \boldsymbol{A}^{T} \boldsymbol{b}, \quad \text { for all } \boldsymbol{w} \in \mathbb{W},`	$\boldsymbol{w}^{T} \boldsymbol{A}^{T} \boldsymbol{A} \hat{\boldsymbol{x}}=\boldsymbol{w}^{T} \boldsymbol{A}^{T} \boldsymbol{b}, \quad \text { for all } \boldsymbol{w} \in \mathbb{W},$	$\boldsymbol{w}^{T} \boldsymbol{A}^{T} \boldsymbol{A} \hat{\boldsymbol{x}}=\boldsymbol{w}^{T} \boldsymbol{A}^{T} \boldsymbol{b}, \quad \text { for all } \boldsymbol{w} \in \mathbb{W},$
lyche-numerical-linear-algebra_EQ0941	319	■ 1.000	`\\|\boldsymbol{b}-\boldsymbol{A} \hat{\boldsymbol{x}}\\|_{2} \leq\\|\boldsymbol{b}-\boldsymbol{A} \boldsymbol{w}\\|_{2}, \quad \text { for all } \boldsymbol{w} \in \mathbb{W} .`	$\\|\boldsymbol{b}-\boldsymbol{A} \hat{\boldsymbol{x}}\\|_{2} \leq\\|\boldsymbol{b}-\boldsymbol{A} \boldsymbol{w}\\|_{2}, \quad \text { for all } \boldsymbol{w} \in \mathbb{W} .$	$\\|\boldsymbol{b}-\boldsymbol{A} \hat{\boldsymbol{x}}\\|_{2} \leq\\|\boldsymbol{b}-\boldsymbol{A} \boldsymbol{w}\\|_{2}, \quad \text { for all } \boldsymbol{w} \in \mathbb{W}.$

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lyche-numerical-linear-algebra_EQ0943	319	1.000	\langle\boldsymbol{v}, \boldsymbol{w}\rangle_{ \boldsymbol{A}}:=\boldsymbol{v}^{T} \boldsymbol{A}^{T} \boldsymbol{A} \boldsymbol{w}, \quad \boldsymbol{v}, \boldsymbol{w} \in \mathbb{R}^{n} .	$\langle \boldsymbol{v}, \boldsymbol{w}\rangle_{\boldsymbol{A}} := \boldsymbol{v}^{T} \boldsymbol{A}^{T} \boldsymbol{A} \boldsymbol{w}, \quad \boldsymbol{v}, \boldsymbol{w} \in \mathbb{R}^{n} .$	$\langle \boldsymbol{v}, \boldsymbol{w}\rangle_{\boldsymbol{A}} := \boldsymbol{v}^{T} \boldsymbol{A}^{T} \boldsymbol{A} \boldsymbol{w}, \quad \boldsymbol{v}, \boldsymbol{w} \in \mathbb{R}^{n} .$
lyche-numerical-linear-algebra_EQ0944	320	1.000	\left\langle\boldsymbol{p}_{k}, \boldsymbol{w}\right \rangle_{\boldsymbol{A}}=0, \quad \text { for all } \boldsymbol{w} \in \mathbb{W}_{k} .	$\left\langle \boldsymbol{p}_{k}, \boldsymbol{w}\right \rangle_{\boldsymbol{A}}=0, \quad \text { for all } \boldsymbol{w} \in \mathbb{W}_{k} .$	$\left\langle \boldsymbol{p}_{k}, \boldsymbol{w}\right \rangle_{\boldsymbol{A}}=0, \quad \text { for all } \boldsymbol{w} \in \mathbb{W}_{k} .$
lyche-numerical-linear-algebra_EQ0952 (13.65)	321	1.000	\langle\boldsymbol{A} \boldsymbol{x}, \boldsymbol{w} \rangle=\langle\boldsymbol{b}, \boldsymbol{w}\rangle \text { for all } \boldsymbol{w} \in \mathcal{W},	$\langle \boldsymbol{A} \boldsymbol{x}, \boldsymbol{w} \rangle=\langle\boldsymbol{b}, \boldsymbol{w}\rangle \text { for all } \boldsymbol{w} \in \mathcal{W},$	$\langle \boldsymbol{A} \boldsymbol{x}, \boldsymbol{w} \rangle=\langle\boldsymbol{b}, \boldsymbol{w}\rangle \text { for all } \boldsymbol{w} \in \mathcal{W},$
lyche-numerical-linear-algebra_EQ0953 (13.66)	322	1.000	\sum_{j=1}^{k} x_{j}\left\langle\boldsymbol{A} \boldsymbol{w}_{j}, \boldsymbol{w}_{i}\right\rangle= \left\langle\boldsymbol{b}, \boldsymbol{w}_{i}\right \rangle, \quad i=1, \ldots, k	$\sum_{j=1}^{k} x_{j}\left\langle\boldsymbol{A} \boldsymbol{w}_{j}, \boldsymbol{w}_{i}\right\rangle=\left\langle\boldsymbol{b}, \boldsymbol{w}_{i}\right \rangle, \quad i=1, \ldots, k$	$\sum_{j=1}^{k} x_{j}\left\langle\boldsymbol{A} \boldsymbol{w}_{j}, \boldsymbol{w}_{i}\right\rangle=\left\langle\boldsymbol{b}, \boldsymbol{w}_{i}\right \rangle, \quad i=1, \ldots, k$
lyche-numerical-linear-algebra_EQ0955	322	1.000	\mathcal{W}_{k}:=\operatorname{span}\left(\boldsymbol{b}, \boldsymbol{B} \boldsymbol{b}, \ldots, \boldsymbol{B}^{k-1} \boldsymbol{b}\right) .	$\mathcal{W}_{k}:=\operatorname{span}\left(\boldsymbol{b}, \boldsymbol{B} \boldsymbol{b}, \ldots, \boldsymbol{B}^{k-1} \boldsymbol{b}\right) .$	$\mathcal{W}_{k}:=\operatorname{span}\left(\boldsymbol{b}, \boldsymbol{B} \boldsymbol{b}, \ldots, \boldsymbol{B}^{k-1} \boldsymbol{b}\right) .$
lyche-numerical-linear-algebra_EQ0956	322	1.000	\left\langle\boldsymbol{A} \boldsymbol{x}_{k}, \boldsymbol{w}\right\rangle=\langle\boldsymbol{b}, \boldsymbol{w}\rangle, \text { for all } \boldsymbol{w} \in \mathcal{W}_{k} .	$\left\langle\boldsymbol{A} \boldsymbol{x}_{k}, \boldsymbol{w}\right\rangle=\langle\boldsymbol{b}, \boldsymbol{w}\rangle, \text { for all } \boldsymbol{w} \in \mathcal{W}_{k} .$	$\left\langle\boldsymbol{A} \boldsymbol{x}_{k}, \boldsymbol{w}\right\rangle=\langle\boldsymbol{b}, \boldsymbol{w}\rangle, \text { for all } \boldsymbol{w} \in \mathcal{W}_{k} .$
lyche-numerical-linear-algebra_EQ0958	322	1.000	\rho_{k} \neq 0, \quad k=0, \ldots, m .	$\rho_{k} \neq 0, \quad k=0, \ldots, m .$	$\rho_{k} \neq 0, \quad k=0, \ldots, m .$
lyche-numerical-linear-algebra_EQ0962 (13.72)	323	1.000	\left\langle\boldsymbol{r}_{k+1}, \boldsymbol{A}^{-1} \boldsymbol{r}_{k+1}\right\rangle=\left\langle \boldsymbol{r}_{k+1}, \boldsymbol{A}^{-1} \boldsymbol{r}_{j}\right\rangle, \quad j=0,1, \ldots, k .	$\left\langle\boldsymbol{r}_{k+1}, \boldsymbol{A}^{-1} \boldsymbol{r}_{k+1}\right\rangle=\left\langle \boldsymbol{r}_{k+1}, \boldsymbol{A}^{-1} \boldsymbol{r}_{j}\right\rangle, \quad j=0,1, \ldots, k .$	$\left\langle\boldsymbol{r}_{k+1}, \boldsymbol{A}^{-1} \boldsymbol{r}_{k+1}\right\rangle=\left\langle \boldsymbol{r}_{k+1}, \boldsymbol{A}^{-1} \boldsymbol{r}_{j}\right\rangle, \quad j=0,1, \ldots, k .$
lyche-numerical-linear-algebra_EQ0963 (13.70)	323	1.000	T_{n}(t)=\cosh (n \operatorname{arccosh} t) \text { for } t \geq 1,	$T_{n}(t)=\cosh (n \operatorname{arccosh} t) \text { for } t \geq 1,$	$T_{n}(t)=\cosh (n \operatorname{arccosh} t) \text { for } t \geq 1,$
lyche-numerical-linear-algebra_EQ0964	324	1.000	\boldsymbol{A} \boldsymbol{x}=\left[\begin{array}{cccc} a_{1,1} & -c_{\frac{3}{2}, 1} & -c_{1, \frac{3}{2}} & 0 \\ -c_{\frac{3}{2}, 1} & a_{2,2} & 0 & -c_{2, \frac{3}{2}} \\ -c_{1, \frac{3}{2}} & 0 & a_{3,3} & -c_{\frac{3}{2},2} \\ 0 & -c_{2, \frac{3}{2}} & -c_{\frac{3}{2},2} & a_{4,4} \end{array}\right]\left[\begin{array}{l} v_{1,1} \\ v_{2,1} \\ v_{1,2} \\ v_{2,2} \end{array}\right]= \left[\begin{array}{l} (d v)_{1,1} \\ (d v)_{2,1} \\ (d v)_{1,2} \\ (d v)_{2,2} \end{array}\right],	$\boldsymbol{A} \boldsymbol{x}=\left[\begin{array}{cccc} a_{1,1} & -c_{\frac{3}{2}, 1} & -c_{1, \frac{3}{2}} & 0 \\ -c_{\frac{3}{2}, 1} & a_{2,2} & 0 & -c_{2, \frac{3}{2}} \\ -c_{1, \frac{3}{2}} & 0 & a_{3,3} & -c_{\frac{3}{2},2} \\ 0 & -c_{2, \frac{3}{2}} & -c_{\frac{3}{2},2} & a_{4,4} \end{array}\right]\left[\begin{array}{l} v_{1,1} \\ v_{2,1} \\ v_{1,2} \\ v_{2,2} \end{array}\right]= \left[\begin{array}{l} (d v)_{1,1} \\ (d v)_{2,1} \\ (d v)_{1,2} \\ (d v)_{2,2} \end{array}\right],$	$\boldsymbol{A} \boldsymbol{x}=\left[\begin{array}{cccc} a_{1,1} & -c_{\frac{3}{2}, 1} & -c_{1, \frac{3}{2}} & 0 \\ -c_{\frac{3}{2}, 1} & a_{2,2} & 0 & -c_{2, \frac{3}{2}} \\ -c_{1, \frac{3}{2}} & 0 & a_{3,3} & -c_{\frac{3}{2},2} \\ 0 & -c_{2, \frac{3}{2}} & -c_{\frac{3}{2},2} & a_{4,4} \end{array}\right]\left[\begin{array}{l} v_{1,1} \\ v_{2,1} \\ v_{1,2} \\ v_{2,2} \end{array}\right]= \left[\begin{array}{l} (d v)_{1,1} \\ (d v)_{2,1} \\ (d v)_{1,2} \\ (d v)_{2,2} \end{array}\right],$

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lyche-numerical-linear-algebra_EQ0965	324	■1.000	`\left[\begin{array}{l} a_{1,1} \\ a_{2,2} \\ a_{3,3} \\ a_{4,4} \end{array}\right]=\left[\begin{array}{l} c_{\frac{1}{2}, 1}+c_{1, \frac{1}{2}}+c_{1, \frac{3}{2}}+c_{\frac{3}{2}, 1} \\ c_{\frac{3}{2}, 1}+c_{2, \frac{1}{2}}+c_{2, \frac{3}{2}}+c_{\frac{5}{2}, 1} \\ c_{\frac{1}{2}, 2}+c_{1, \frac{3}{2}}+c_{1, \frac{5}{2}}+c_{\frac{3}{2}, 2} \\ c_{\frac{3}{2}, 2}+c_{2, \frac{3}{2}}+c_{2, \frac{5}{2}}+c_{\frac{5}{2}, 2} \end{array}\right] .`	$\left[\begin{array}{l} a_{1,1} \\ a_{2,2} \\ a_{3,3} \\ a_{4,4} \end{array}\right]=\left[\begin{array}{l} c_{\frac{1}{2}, 1}+c_{1, \frac{1}{2}}+c_{1, \frac{3}{2}}+c_{\frac{3}{2}, 1} \\ c_{\frac{3}{2}, 1}+c_{2, \frac{1}{2}}+c_{2, \frac{3}{2}}+c_{\frac{5}{2}, 1} \\ c_{\frac{1}{2}, 2}+c_{1, \frac{3}{2}}+c_{1, \frac{5}{2}}+c_{\frac{3}{2}, 2} \\ c_{\frac{3}{2}, 2}+c_{2, \frac{3}{2}}+c_{2, \frac{5}{2}}+c_{\frac{5}{2}, 2} \end{array}\right] .$	$\left[\begin{array}{l} a_{1,1} \\ a_{2,2} \\ a_{3,3} \\ a_{4,4} \end{array}\right]=\left[\begin{array}{l} c_{\frac{1}{2}, 1}+c_{1, \frac{1}{2}}+c_{1, \frac{3}{2}}+c_{\frac{3}{2}, 1} \\ c_{\frac{3}{2}, 1}+c_{2, \frac{1}{2}}+c_{2, \frac{3}{2}}+c_{\frac{5}{2}, 1} \\ c_{\frac{1}{2}, 2}+c_{1, \frac{3}{2}}+c_{1, \frac{5}{2}}+c_{\frac{3}{2}, 2} \\ c_{\frac{3}{2}, 2}+c_{2, \frac{3}{2}}+c_{2, \frac{5}{2}}+c_{\frac{5}{2}, 2} \end{array}\right] .$
lyche-numerical-linear-algebra_EQ0966	326	■1.000	`\boldsymbol{A}=\operatorname{diag}\left( \boldsymbol{A}_{1}, \boldsymbol{A}_{2}, \ldots, \boldsymbol{A}_{r}\right), \quad \boldsymbol{A}_{i} \in \mathbb{C}^{m_{i} \times m_{i}} .`	$\boldsymbol{A}=\operatorname{diag}\left(\boldsymbol{A}_{1}, \boldsymbol{A}_{2}, \ldots, \boldsymbol{A}_{r}\right), \quad \boldsymbol{A}_{i} \in \mathbb{C}^{m_{i} \times m_{i}} .$	$\boldsymbol{A}=\operatorname{diag}\left(\boldsymbol{A}_{1}, \boldsymbol{A}_{2}, \ldots, \boldsymbol{A}_{r}\right), \quad \boldsymbol{A}_{i} \in \mathbb{C}^{m_{i} \times m_{i}} .$
lyche-numerical-linear-algebra_EQ0968	327	■1.000	`\operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I})=\prod_{i=1}^{r} \operatorname{det}\left( \boldsymbol{A}_{i i}-\lambda \boldsymbol{I}\right)`	$\operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I})=\prod_{i=1}^{r} \operatorname{det}\left(\boldsymbol{A}_{i i}-\lambda \boldsymbol{I}\right)$	$\operatorname{det}(\boldsymbol{A}-\lambda \boldsymbol{I})=\prod_{i=1}^{r} \operatorname{det}\left(\boldsymbol{A}_{i i}-\lambda \boldsymbol{I}\right)$
lyche-numerical-linear-algebra_EQ0970	328	■1.000	`\left|\lambda-a_{i i}\right|=\left|\sum_{j \neq i} a_{i j} x_{j} / x_{i}\right| \leq \sum_{j \neq i}\left|a_{i j} \right|\left|x_{j} / x_{i}\right| \leq r_{i}`	$\left\|\lambda-a_{i i}\right\|=\left\|\sum_{j \neq i} a_{i j} x_{j} / x_{i}\right\| \leq \sum_{j \neq i}\left\|a_{i j} \right\|\left\|x_{j} / x_{i}\right\| \leq r_{i}$	$\left\|\lambda-a_{i i}\right\|=\left\|\sum_{j \neq i} a_{i j} x_{j} / x_{i}\right\| \leq \sum_{j \neq i}\left\|a_{i j} \right\|\left\|x_{j} / x_{i}\right\| \leq r_{i}$
lyche-numerical-linear-algebra_EQ0971	328	■1.000	`R_{i}=\{z \in \mathbb{R}:|z-2| \leq 2\}, \quad i=2,3, \ldots, m-1 .`	$R_{i}=\{z \in \mathbb{R}:\|z-2\| \leq 2\}, \quad i=2,3, \ldots, m-1 .$	$R_{i}=\{z \in \mathbb{R}:\|z-2\| \leq 2\}, \quad i=2,3, \ldots, m-1 .$
lyche-numerical-linear-algebra_EQ0972	328	■1.000	`\lambda_{j}=4\left[\sin \frac{j \pi}{2(m+1)}\right]^{2}, \quad j=1,2, \ldots, m .`	$\lambda_{j}=4\left[\sin \frac{j \pi}{2(m+1)}\right]^{2}, \quad j=1,2, \ldots, m .$	$\lambda_{j}=4\left[\sin \frac{j \pi}{2(m+1)}\right]^{2}, \quad j=1,2, \ldots, m .$
lyche-numerical-linear-algebra_EQ0973	329	■1.000	`\boldsymbol{A}(t):=\boldsymbol{D}+t(\boldsymbol{A}-\boldsymbol{D}), \quad \boldsymbol{D}:=\operatorname{diag}\left(a_{11}, \ldots, a_{n n}\right), \quad t \in[0,1] .`	$\boldsymbol{A}(t):=\boldsymbol{D}+t(\boldsymbol{A}-\boldsymbol{D}), \quad \boldsymbol{D}:=\operatorname{diag}\left(a_{11}, \ldots, a_{n n}\right), \quad t \in[0,1] .$	$\boldsymbol{A}(t):=\boldsymbol{D}+t(\boldsymbol{A}-\boldsymbol{D}), \quad \boldsymbol{D}:=\operatorname{diag}\left(a_{11}, \ldots, a_{n n}\right), \quad t \in[0,1] .$
lyche-numerical-linear-algebra_EQ0974	329	■1.000	`R_{i}(t)=\left\{z \in \mathbb{C}:\left|z-a_{i i}\right| \leq t r_{i}\right\}, \quad r_{i}:=\sum_{\substack{j=1 \\ j \neq i}}^{n}\left|a_{i j}\right| .`	$R_{i}(t)=\left\{z \in \mathbb{C}:\left\|z-a_{i i}\right\| \leq t r_{i}\right\}, \quad r_{i}:=\sum_{\substack{j=1 \\ j \neq i}}^{n}\left\|a_{i j}\right\| .$	$R_{i}(t)=\left\{z \in \mathbb{C}:\left\|z-a_{i i}\right\| \leq t r_{i}\right\}, \quad r_{i}:=\sum_{\substack{j=1 \\ j \neq i}}^{n}\left\|a_{i j}\right\| .$
lyche-numerical-linear-algebra_EQ0978	330	■1.000	`\begin{aligned} & \left|\mu-\lambda_{1}\right|^{n} \leq \prod_{j=1}^{n}\left|\mu-\lambda_{j}\right|=\left| \operatorname{det}(\mu \boldsymbol{I}-\boldsymbol{A})\right|= \left|\operatorname{det}\left((\mu \boldsymbol{I}-\boldsymbol{A})\left[\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{n}\right]\right)\right| \\ & \leq\left|(\mu \boldsymbol{I}-\boldsymbol{A}) \boldsymbol{u}_{1}\right|_{2} \prod_{j=2}^{n}\left|(\mu \boldsymbol{I}-\boldsymbol{A}) \boldsymbol{u}_{j}\right|_{2} \leq|\boldsymbol{E}|_{2}\left(|(\boldsymbol{A}+\boldsymbol{E})|_{2}+|\boldsymbol{A}|_{2}\right)^{n-1} . \end{aligned}`	$\begin{aligned} & \left\|\mu-\lambda_{1}\right\|^{n} \leq \prod_{j=1}^{n}\left\|\mu-\lambda_{j}\right\|=\left\| \operatorname{det}(\mu \boldsymbol{I}-\boldsymbol{A})\right\|= \left\|\operatorname{det}\left((\mu \boldsymbol{I}-\boldsymbol{A})\left[\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{n}\right]\right)\right\| \\ & \leq\left\|(\mu \boldsymbol{I}-\boldsymbol{A}) \boldsymbol{u}_{1}\right\|_{2} \prod_{j=2}^{n}\left\|(\mu \boldsymbol{I}-\boldsymbol{A}) \boldsymbol{u}_{j}\right\|_{2} \leq\|\boldsymbol{E}\|_{2}\left(\|(\boldsymbol{A}+\boldsymbol{E})\|_{2}+\|\boldsymbol{A}\|_{2}\right)^{n-1} . \end{aligned}$	$\begin{aligned} & \left\|\mu-\lambda_{1}\right\|^{n} \leq \prod_{j=1}^{n}\left\|\mu-\lambda_{j}\right\|=\left\| \operatorname{det}(\mu \boldsymbol{I}-\boldsymbol{A})\right\|= \left\|\operatorname{det}\left((\mu \boldsymbol{I}-\boldsymbol{A})\left[\boldsymbol{u}_{1}, \ldots, \boldsymbol{u}_{n}\right]\right)\right\| \\ & \leq\left\|(\mu \boldsymbol{I}-\boldsymbol{A}) \boldsymbol{u}_{1}\right\|_{2} \prod_{j=2}^{n}\left\|(\mu \boldsymbol{I}-\boldsymbol{A}) \boldsymbol{u}_{j}\right\|_{2} \leq\|\boldsymbol{E}\|_{2}\left(\|(\boldsymbol{A}+\boldsymbol{E})\|_{2}+\|\boldsymbol{A}\|_{2}\right)^{n-1} . \end{aligned}$

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lyche-numerical-linear-algebra_EQ0979 (14.2)	331	1.000	`|\lambda-\mu| \leq K_{p}(\boldsymbol{X})|\boldsymbol{r}|_{p}, \quad 1 \leq p \leq \infty,`	$\|\lambda-\mu\| \leq K_p(\boldsymbol{X})\|\boldsymbol{r}\|_p, \quad 1 \leq p \leq \infty,$	$\|\lambda-\mu\| \leq K_p(\boldsymbol{X})\|\boldsymbol{r}\|_p, \quad 1 \leq p \leq \infty,$
lyche-numerical-linear-algebra_EQ0980 (14.3)	331	1.000	`|\lambda-\mu| \leq K_{p}(\boldsymbol{X})|\boldsymbol{E}|_{p}, \quad 1 \leq p \leq \infty,`	$\|\lambda-\mu\| \leq K_p(\boldsymbol{X})\|\boldsymbol{E}\|_p, \quad 1 \leq p \leq \infty,$	$\|\lambda-\mu\| \leq K_p(\boldsymbol{X})\|\boldsymbol{E}\|_p, \quad 1 \leq p \leq \infty,$
lyche-numerical-linear-algebra_EQ0983	332	1.000	`|\boldsymbol{A} \boldsymbol{x}|_{p}=\left|\left[ \lambda_{1} x_{1}, \ldots, \lambda_{n} x_{n}\right]^{T} \right|_{p}=\left(\sum_{j=1}^{n}\left|\lambda_{j} \right|^{p}\left|x_{j}\right|^{p}\right)^{1 / p} \leq \rho(\boldsymbol{A})|\boldsymbol{x}|_{p} .`	$\|\boldsymbol{A}\boldsymbol{x}\|_p = \left\|[\lambda_1 x_1, \ldots, \lambda_n x_n]^T\right\|_p = \left(\sum_{j=1}^{n} \|\lambda_j\|^p \, \|x_j\|^p\right)^{1/p} \leq \rho(\boldsymbol{A})\|\boldsymbol{x}\|_p.$	$\|\boldsymbol{A}\boldsymbol{x}\|_p = \|[\lambda_1 x_1, \ldots, \lambda_n x_n]^T\|_p = \big(\sum_{j=1}^{n} \|\lambda_j\|^p \|x_j\|^p\big)^{1/p} \leq \rho(\boldsymbol{A})\|\boldsymbol{x}\|_p.$
lyche-numerical-linear-algebra_EQ0984 (14.4)	332	1.000	`\frac{|\lambda-\mu|}{|\lambda|} \leq K_{p}( \boldsymbol{X}) K_{p}(\boldsymbol{A}) \frac{\\| \boldsymbol{r}\\|_{p}}{\\|\boldsymbol{A}\\|_{p}}, \quad 1 \leq p \leq \infty,`	$\frac{\|\lambda-\mu\|}{\|\lambda\|} \leq K_p(\boldsymbol{X}) K_p(\boldsymbol{A}) \frac{\|\boldsymbol{r}\|_p}{\|\boldsymbol{A}\|_p}, \quad 1 \leq p \leq \infty,$	$\frac{\|\lambda-\mu\|}{\|\lambda\|} \leq K_p(\boldsymbol{X}) K_p(\boldsymbol{A}) \frac{\|\boldsymbol{r}\|_p}{\|\boldsymbol{A}\|_p}, \quad 1 \leq p \leq \infty,$
lyche-numerical-linear-algebra_EQ0985 (14.5)	332	1.000	`\frac{|\lambda-\mu|}{|\lambda|} \leq K_{p}( \boldsymbol{X})\left|\boldsymbol{A}^{-1} \boldsymbol{E} \right|_{p} \leq K_{p}(\boldsymbol{X}) K_{p}( \boldsymbol{A}) \frac{\\|\boldsymbol{E}\\|_{p}}{\\| \boldsymbol{A}\\|_{p}}, \quad 1 \leq p \leq \infty,`	$\frac{\|\lambda-\mu\|}{\|\lambda\|} \leq K_p(\boldsymbol{X}) \left\|\boldsymbol{A}^{-1}\boldsymbol{E}\right\|_p \leq K_p(\boldsymbol{X}) K_p(\boldsymbol{A}) \frac{\|\boldsymbol{E}\|_p}{\|\boldsymbol{A}\|_p}, \quad 1 \leq p \leq \infty,$	$\frac{\|\lambda-\mu\|}{\|\lambda\|} \leq K_p(\boldsymbol{X})\|\boldsymbol{A}^{-1}\boldsymbol{E}\|_p \leq K_p(\boldsymbol{X}) K_p(\boldsymbol{A}) \frac{\|\boldsymbol{E}\|_p}{\|\boldsymbol{A}\|_p}, \quad 1 \leq p \leq \infty,$
lyche-numerical-linear-algebra_EQ0987	333	1.000	`(\boldsymbol{B}+\boldsymbol{F}-\boldsymbol{I}) \boldsymbol{x}=\left(\mu \boldsymbol{A}^{-1}- \boldsymbol{A}^{-1} \boldsymbol{E}-\boldsymbol{I}\right) \boldsymbol{x}=\boldsymbol{A}^{-1}(\mu \boldsymbol{I}-( \boldsymbol{E}+\boldsymbol{A})) \boldsymbol{x}=\mathbf{0} .`	$(\boldsymbol{B}+\boldsymbol{F}-\boldsymbol{I})\boldsymbol{x} = \left(\mu\boldsymbol{A}^{-1} - \boldsymbol{A}^{-1}\boldsymbol{E} - \boldsymbol{I}\right)\boldsymbol{x} = \boldsymbol{A}^{-1}(\mu\boldsymbol{I} - (\boldsymbol{E}+\boldsymbol{A}))\boldsymbol{x} = \mathbf{0}.$	$(\boldsymbol{B}+\boldsymbol{F}-\boldsymbol{I})\boldsymbol{x} = (\mu\boldsymbol{A}^{-1} - \boldsymbol{A}^{-1}\boldsymbol{E} - \boldsymbol{I})\boldsymbol{x} = \boldsymbol{A}^{-1}\big(\mu\boldsymbol{I} - (\boldsymbol{E}+\boldsymbol{A})\big)\boldsymbol{x} = \mathbf{0}.$
lyche-numerical-linear-algebra_EQ0988	333	1.000	`\boldsymbol{A}_{k+1}^{*}=\left(\boldsymbol{H}_{k} \boldsymbol{A}_{k} \boldsymbol{H}_{k}\right)^{*}= \boldsymbol{H}_{k} \boldsymbol{A}_{k}^{*} \boldsymbol{H}_{k}=\boldsymbol{A}_{k+1} .`	$\boldsymbol{A}_{k+1}^* = (\boldsymbol{H}_k\boldsymbol{A}_k\boldsymbol{H}_k)^* = \boldsymbol{H}_k\boldsymbol{A}_k^*\boldsymbol{H}_k = \boldsymbol{A}_{k+1}.$	$\boldsymbol{A}_{k+1}^* = (\boldsymbol{H}_k\boldsymbol{A}_k\boldsymbol{H}_k)^* = \boldsymbol{H}_k\boldsymbol{A}_k^*\boldsymbol{H}_k = \boldsymbol{A}_{k+1}.$
lyche-numerical-linear-algebra_EQ0990	334	1.000	`\boldsymbol{H}_{k}=\left[\begin{array}{cc} \boldsymbol{I}_{k} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{V}_{k} \end{array}\right] \in \mathbb{C}^{n \times n} .`	$\boldsymbol{H}_k = \begin{bmatrix} \boldsymbol{I}_k & \mathbf{0} \\ \mathbf{0} & \boldsymbol{V}_k \end{bmatrix} \in \mathbb{C}^{n\times n}.$	$\boldsymbol{H}_k = \begin{bmatrix} \boldsymbol{I}_k & \mathbf{0} \\ \mathbf{0} & \boldsymbol{V}_k \end{bmatrix} \in \mathbb{C}^{n\times n}.$
lyche-numerical-linear-algebra_EQ0993	335	1.000	`\boldsymbol{Q}_{k}=\left[\begin{array}{cc} \boldsymbol{I}_{k} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{I}-\boldsymbol{v}_{k} \boldsymbol{v}_{k}^{T} \end{array}\right] *\left[\begin{array}{cc} \boldsymbol{I}_{k} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{U}_{k} \end{array}\right]=\left[\begin{array}{cc} \boldsymbol{I}_{k} & \mathbf{0} \\ \mathbf{0} & \boldsymbol{U}_{k}-\boldsymbol{v}_{k} \left(\boldsymbol{v}_{k}^{T} \boldsymbol{U}_{k}\right) \end{array}\right] .`	$\boldsymbol{Q}_k = \begin{bmatrix} \boldsymbol{I}_k & \mathbf{0} \\ \mathbf{0} & \boldsymbol{I} - \boldsymbol{v}_k\boldsymbol{v}_k^T \end{bmatrix} * \begin{bmatrix} \boldsymbol{I}_k & \mathbf{0} \\ \mathbf{0} & \boldsymbol{U}_k \end{bmatrix} = \begin{bmatrix} \boldsymbol{I}_k & \mathbf{0} \\ \mathbf{0} & \boldsymbol{U}_k - \boldsymbol{v}_k\left(\boldsymbol{v}_k^T\boldsymbol{U}_k\right) \end{bmatrix}.$	$\boldsymbol{Q}_k = \begin{bmatrix} \boldsymbol{I}_k & \mathbf{0} \\ \mathbf{0} & \boldsymbol{I} - \boldsymbol{v}_k\boldsymbol{v}_k^T \end{bmatrix} * \begin{bmatrix} \boldsymbol{I}_k & \mathbf{0} \\ \mathbf{0} & \boldsymbol{U}_k \end{bmatrix} = \begin{bmatrix} \boldsymbol{I}_k & \mathbf{0} \\ \mathbf{0} & \boldsymbol{U}_k - \boldsymbol{v}_k(\boldsymbol{v}_k^T\boldsymbol{U}_k) \end{bmatrix}.$
lyche-numerical-linear-algebra_EQ0996 (14.7)	336	1.000	`p_{k+1}(x)=\left(x-d_{k+1}\right) p_{k}(x)-c_{k}^{2} p_{k-1}(x) .`	$p_{k+1}(x) = (x - d_{k+1})\, p_k(x) - c_k^2 p_{k-1}(x).$	$p_{k+1}(x) = (x - d_{k+1}) p_k(x) - c_k^2 p_{k-1}(x).$
lyche-numerical-linear-algebra_EQ1001	337	1.000	`p_{k+1}\left(y_{j}\right)=(-1)^{k+1-j}\left|p_{k+1} \left(y_{j}\right)\right| \neq 0, \text { for } j=0,1, \ldots, k+1 .`	$p_{k+1}\left(y_j\right) = (-1)^{k+1-j}\left\|p_{k+1}\left(y_j\right)\right\| \neq 0, \text{ for } j = 0, 1, \ldots, k+1.$	$p_{k+1}(y_j) = (-1)^{k+1-j}\|p_{k+1}(y_j)\| \neq 0, \text{ for } j = 0, 1, \ldots, k+1.$

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lyche-numerical-linear-algebra_EQ1002	337	1.000	`p_{k+1}\left(y_{j}\right)=-c_{k}^{2} p_{k-1}\left(y_{j}\right)=-c_{k}^{2}\left(y_{j}-z_{1}\right) \cdots \left(y_{j}-z_{k-1}\right) .`	$p_{k+1}\left(y_j\right)=-c_k^2 p_{k-1}\left(y_j\right)=-c_k^2\left(y_j-z_1\right) \cdots \left(y_j-z_{k-1}\right) .$	$p_{k+1}(y_j)=-c_k^2 p_{k-1}(y_j)=-c_k^2(y_j-z_1)\cdots(y_j-z_{k-1}).$
lyche-numerical-linear-algebra_EQ1003	337	1.000	`\boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{y}= \sum_{i=1}^{n} \lambda_{i}\left|y_{i}\right|^{2}= \sum_{i=1}^{k} \lambda_{i}\left|x_{i}\right|^{2}>0 .`	$\boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{y}= \sum_{i=1}^{n} \lambda_{i}\left\|y_{i}\right\|^{2}= \sum_{i=1}^{k} \lambda_{i}\left\|x_{i}\right\|^{2}>0 .$	$\boldsymbol{y}^{*} \boldsymbol{A} \boldsymbol{y}= \sum_{i=1}^{n} \lambda_{i}\left\|y_{i}\right\|^{2}= \sum_{i=1}^{k} \lambda_{i}\left\|x_{i}\right\|^{2}>0 .$
lyche-numerical-linear-algebra_EQ1005 (14.8)	338	1.000	`d_{1}(\alpha)=d_{1}-\alpha, d_{k}(\alpha)=d_{k}-\alpha-c_{k-1}^{2} / d_{k-1}(\alpha), k=2,3, \ldots, n .`	$d_{1}(\alpha)=d_{1}-\alpha, d_{k}(\alpha)=d_{k}-\alpha-c_{k-1}^{2} / d_{k-1}(\alpha), k=2,3, \ldots, n .$	$d_{1}(\alpha)=d_{1}-\alpha, d_{k}(\alpha)=d_{k}-\alpha-c_{k-1}^{2} / d_{k-1}(\alpha), k=2,3, \ldots, n .$
lyche-numerical-linear-algebra_EQ1006	338	1.000	`\rho(x):=\#\left\{k: d_{k}(x)>0 \text { for } k=1, \ldots, n\right\}`	$\rho(x):=\#\left\{k: d_{k}(x)>0 \text { for } k=1, \ldots, n\right\}$	$\rho(x):=\#\left\{k: d_{k}(x)>0 \text { for } k=1, \ldots, n\right\}$
lyche-numerical-linear-algebra_EQ1007	340	1.000	`\boldsymbol{A}=\left(\begin{array}{llll} 4 & 1 & 0 & 0 \\ 1 & 4 & 1 & 0 \\ 0 & 1 & 4 & 1 \\ 0 & 0 & 1 & 4 \end{array}\right) .`	$\boldsymbol{A}=\left(\begin{array}{llll} 4 & 1 & 0 & 0 \\ 1 & 4 & 1 & 0 \\ 0 & 1 & 4 & 1 \\ 0 & 0 & 1 & 4 \end{array}\right) .$	$\boldsymbol{A}=\left(\begin{array}{llll} 4 & 1 & 0 & 0 \\ 1 & 4 & 1 & 0 \\ 0 & 1 & 4 & 1 \\ 0 & 0 & 1 & 4 \end{array}\right) .$
lyche-numerical-linear-algebra_EQ1008	340	1.000	`\boldsymbol{A}(t):=\boldsymbol{D}+t(\boldsymbol{A}-\boldsymbol{D}), \quad \boldsymbol{D}:= \operatorname{diag}\left(a_{11}, \ldots, a_{n n}\right), \quad t \in \mathbb{R} .`	$\boldsymbol{A}(t):=\boldsymbol{D}+t(\boldsymbol{A}-\boldsymbol{D}), \quad \boldsymbol{D}:= \operatorname{diag}\left(a_{11}, \ldots, a_{n n}\right), \quad t \in \mathbb{R} .$	$\boldsymbol{A}(t):=\boldsymbol{D}+t(\boldsymbol{A}-\boldsymbol{D}), \quad \boldsymbol{D}:= \operatorname{diag}\left(a_{11}, \ldots, a_{n n}\right), \quad t \in \mathbb{R} .$
lyche-numerical-linear-algebra_EQ1009	340	1.000	`|\lambda-\mu| \leq C\left(t_{2}-t_{1}\right)^{1 / n}, \text { where } C \leq 2\left(\\|\boldsymbol{D}\\|_{2}+\\| \boldsymbol{A}-\boldsymbol{D}\\|_{2}\right) .`	$\|\lambda-\mu\| \leq C\left(t_{2}-t_{1}\right)^{1 / n}, \text { where } C \leq 2\left(\\|\boldsymbol{D}\\|_{2}+\\|\boldsymbol{A}-\boldsymbol{D}\\|_{2}\right) .$	$\|\lambda-\mu\| \leq C\left(t_{2}-t_{1}\right)^{1 / n}, \text { where } C \leq 2\left(\\|\boldsymbol{D}\\|_{2}+\\|\boldsymbol{A}-\boldsymbol{D}\\|_{2}\right) .$
lyche-numerical-linear-algebra_EQ1013	342	1.000	`\boldsymbol{D}^{-1 / 2}:=\operatorname{diag} \left(d_{1}^{-1 / 2}, \ldots, d_{n}^{-1 / 2}\right) .`	$\boldsymbol{D}^{-1 / 2}:=\operatorname{diag}\left(d_{1}^{-1 / 2}, \ldots, d_{n}^{-1 / 2}\right) .$	$\boldsymbol{D}^{-1 / 2}:=\operatorname{diag}\left(d_{1}^{-1 / 2}, \ldots, d_{n}^{-1 / 2}\right) .$
lyche-numerical-linear-algebra_EQ1027	347	1.000	`\rho(\lambda)^{2}=\left|\boldsymbol{u}^{*} \boldsymbol{A} \boldsymbol{u}-\lambda\right|^{2}+\left| \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{u}\right \\|_{2}^{2},`	$\rho(\lambda)^{2}=\left\|\boldsymbol{u}^{*} \boldsymbol{A} \boldsymbol{u}-\lambda\right\|^{2}+\left\| \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{u}\right \\|_{2}^{2},$	$\rho(\lambda)^{2}=\left\|\boldsymbol{u}^{*} \boldsymbol{A} \boldsymbol{u}-\lambda\right\|^{2}+\left\| \boldsymbol{U}^{*} \boldsymbol{A} \boldsymbol{u}\right \\|_{2}^{2},$
lyche-numerical-linear-algebra_EQ1028	347	1.000	`\frac{|\lambda-\mu|}{|\lambda|} \leq K_{2}( \boldsymbol{X}) K_{2}(\boldsymbol{A}) \frac{\\| \boldsymbol{A} \boldsymbol{u}-\mu \boldsymbol{u}\\|_{2}}{ \\|\boldsymbol{A}\\|_{2}} .`	$\frac{\|\lambda-\mu\|}{\|\lambda\|} \leq K_{2}(\boldsymbol{X}) K_{2}(\boldsymbol{A}) \frac{\\| \boldsymbol{A} \boldsymbol{u}-\mu \boldsymbol{u}\\|_{2}}{ \\|\boldsymbol{A}\\|_{2}} .$	$\frac{\|\lambda-\mu\|}{\|\lambda\|} \leq K_{2}(\boldsymbol{X}) K_{2}(\boldsymbol{A}) \frac{\\| \boldsymbol{A} \boldsymbol{u}-\mu \boldsymbol{u}\\|_{2}}{ \\|\boldsymbol{A}\\|_{2}} .$
lyche-numerical-linear-algebra_EQ1033	349	1.000	`\rho_{k}:=\frac{\boldsymbol{y}_{k}^{*} \boldsymbol{x}_{k-1}}{\boldsymbol{y}_{k}^{*} \boldsymbol{y}_{k}}, \quad \boldsymbol{w}_{k}:=\frac{ \boldsymbol{x}_{k-1}}{\left|\boldsymbol{y}_{k}\right \\|_{2}} .`	$\rho_{k}:=\frac{\boldsymbol{y}_{k}^{*} \boldsymbol{x}_{k-1}}{\boldsymbol{y}_{k}^{*} \boldsymbol{y}_{k}}, \quad \boldsymbol{w}_{k}:=\frac{ \boldsymbol{x}_{k-1}}{\left\|\boldsymbol{y}_{k}\right \\|_{2}} .$	$\rho_{k}:=\frac{\boldsymbol{y}_{k}^{*} \boldsymbol{x}_{k-1}}{\boldsymbol{y}_{k}^{*} \boldsymbol{y}_{k}}, \quad \boldsymbol{w}_{k}:=\frac{ \boldsymbol{x}_{k-1}}{\left\|\boldsymbol{y}_{k}\right \\|_{2}} .$
lyche-numerical-linear-algebra_EQ1036 (15.9)	351	1.000	`\boldsymbol{A}_{k+1}=\boldsymbol{R}_{k} \boldsymbol{Q}_{k}=\boldsymbol{Q}_{k}^{*} \boldsymbol{A}_{k} \boldsymbol{Q}_{k},`	$\boldsymbol{A}_{k+1}=\boldsymbol{R}_{k} \boldsymbol{Q}_{k}=\boldsymbol{Q}_{k}^{*} \boldsymbol{A}_{k} \boldsymbol{Q}_{k},$	$\boldsymbol{A}_{k+1}=\boldsymbol{R}_{k} \boldsymbol{Q}_{k}=\boldsymbol{Q}_{k}^{*} \boldsymbol{A}_{k} \boldsymbol{Q}_{k},$
lyche-numerical-linear-algebra_EQ1037	351	1.000	`\boldsymbol{A}_{1}=\boldsymbol{A}=\left[\begin{array}{ll} 2 & 1 \\ 1 & 2 \end{array}\right]=\left(\frac{1}{ \sqrt{5}}\left[\begin{array}{cc} -2 & -1 \\ -1 & 2 \end{array}\right]\right) *\left(\frac{1}{\sqrt{5}}\left[\begin{array}{cc} -5 & -4 \\ 0 & 3 \end{array}\right] \right)=\boldsymbol{Q}_{1} \boldsymbol{R}_{1}`	$\boldsymbol{A}_{1}=\boldsymbol{A}=\left[\begin{array}{ll} 2 & 1 \\ 1 & 2 \end{array}\right]=\left(\frac{1}{ \sqrt{5}}\left[\begin{array}{cc} -2 & -1 \\ -1 & 2 \end{array}\right]\right) *\left(\frac{1}{\sqrt{5}}\left[\begin{array}{cc} -5 & -4 \\ 0 & 3 \end{array}\right] \right)=\boldsymbol{Q}_{1} \boldsymbol{R}_{1}$	$\boldsymbol{A}_{1}=\boldsymbol{A}=\left[\begin{array}{ll} 2 & 1 \\ 1 & 2 \end{array}\right]=\left(\frac{1}{ \sqrt{5}}\left[\begin{array}{cc} -2 & -1 \\ -1 & 2 \end{array}\right]\right) *\left(\frac{1}{\sqrt{5}}\left[\begin{array}{cc} -5 & -4 \\ 0 & 3 \end{array}\right] \right)=\boldsymbol{Q}_{1} \boldsymbol{R}_{1}$

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lyche-numerical-linear-algebra_EQ1038	351	1.000	\boldsymbol{A}_{2}=\boldsymbol{R}_{1} \boldsymbol{Q}_{1}= \frac{1}{5}\left[\begin{array}{cc} -5 & -4 \\ 0 & 3 \end{array}\right] *\left[\begin{array}{cc} -2 & -1 \\ -1 & 2 \end{array}\right]=\frac{1}{5}\left[\begin{array}{cc} 14 & -3 \\ -3 & 6 \end{array}\right]= \left[\begin{array}{cc} 2.8 & -0.6 \\ -0.6 & 1.2 \end{array}\right] .	$\boldsymbol{A}_{2}=\boldsymbol{R}_{1} \boldsymbol{Q}_{1}= \frac{1}{5}\left[\begin{array}{cc} -5 & -4 \\ 0 & 3 \end{array}\right] *\left[\begin{array}{cc} -2 & -1 \\ -1 & 2 \end{array}\right]=\frac{1}{5}\left[\begin{array}{cc} 14 & -3 \\ -3 & 6 \end{array}\right]= \left[\begin{array}{cc} 2.8 & -0.6 \\ -0.6 & 1.2 \end{array}\right] .$	$\boldsymbol{A}_{2}=\boldsymbol{R}_{1} \boldsymbol{Q}_{1}= \frac{1}{5}\left[\begin{array}{cc} -5 & -4 \\ 0 & 3 \end{array}\right] *\left[\begin{array}{cc} -2 & -1 \\ -1 & 2 \end{array}\right]=\frac{1}{5}\left[\begin{array}{cc} 14 & -3 \\ -3 & 6 \end{array}\right]= \left[\begin{array}{cc} 2.8 & -0.6 \\ -0.6 & 1.2 \end{array}\right] .$
lyche-numerical-linear-algebra_EQ1039	351	1.000	\boldsymbol{A}_{4} \approx\left[\begin{array}{cc} 2.997 & -0.074 \\ -0.074 & 1.0027 \end{array}\right], \quad \boldsymbol{A}_{10} \approx\left[\begin{array}{cc} 3.0000 & -0.0001 \\ -0.0001 & 1.0000 \end{array}\right]	$\boldsymbol{A}_{4} \approx\left[\begin{array}{cc} 2.997 & -0.074 \\ -0.074 & 1.0027 \end{array}\right], \quad \boldsymbol{A}_{10} \approx\left[\begin{array}{cc} 3.0000 & -0.0001 \\ -0.0001 & 1.0000 \end{array}\right]$	$\boldsymbol{A}_{4} \approx\left[\begin{array}{cc} 2.997 & -0.074 \\ -0.074 & 1.0027 \end{array}\right], \quad \boldsymbol{A}_{10} \approx\left[\begin{array}{cc} 3.0000 & -0.0001 \\ -0.0001 & 1.0000 \end{array}\right]$
lyche-numerical-linear-algebra_EQ1040	352	1.000	A_{1}=A=\left[\begin{array}{llll} 0.9501 & 0.8913 & 0.8214 & 0.9218 \\ 0.2311 & 0.7621 & 0.4447 & 0.7382 \\ 0.6068 & 0.4565 & 0.6154 & 0.1763 \\ 0.4860 & 0.0185 & 0.7919 & 0.4057 \end{array}\right]	$A_{1}=A=\left[\begin{array}{llll} 0.9501 & 0.8913 & 0.8214 & 0.9218 \\ 0.2311 & 0.7621 & 0.4447 & 0.7382 \\ 0.6068 & 0.4565 & 0.6154 & 0.1763 \\ 0.4860 & 0.0185 & 0.7919 & 0.4057 \end{array}\right]$	$A_{1}=A=\left[\begin{array}{llll} 0.9501 & 0.8913 & 0.8214 & 0.9218 \\ 0.2311 & 0.7621 & 0.4447 & 0.7382 \\ 0.6068 & 0.4565 & 0.6154 & 0.1763 \\ 0.4860 & 0.0185 & 0.7919 & 0.4057 \end{array}\right]$
lyche-numerical-linear-algebra_EQ1042 (15.10)	352	1.000	\tilde{\boldsymbol{Q}}_{k}:=\boldsymbol{Q}_{1} \cdots \boldsymbol{Q}_{k} \text { and } \tilde{ \boldsymbol{R}}_{k}:=\boldsymbol{R}_{k} \cdots \boldsymbol{R}_{1},	$\tilde{\boldsymbol{Q}}_{k}:=\boldsymbol{Q}_{1} \cdots \boldsymbol{Q}_{k} \text { and } \tilde{ \boldsymbol{R}}_{k}:=\boldsymbol{R}_{k} \cdots \boldsymbol{R}_{1},$	$\tilde{\boldsymbol{Q}}_{k}:=\boldsymbol{Q}_{1} \cdots \boldsymbol{Q}_{k} \text { and } \tilde{ \boldsymbol{R}}_{k}:=\boldsymbol{R}_{k} \cdots \boldsymbol{R}_{1},$
lyche-numerical-linear-algebra_EQ1044 (15.11)	353	1.000	\boldsymbol{A}_{k}=\boldsymbol{Q}_{k-1}^{*} \boldsymbol{A}_{k-1} \boldsymbol{Q}_{k-1}= \boldsymbol{Q}_{k-1}^{*} \boldsymbol{Q}_{k-2}^{*} \boldsymbol{A}_{k-2} \boldsymbol{Q}_{k-2} \boldsymbol{Q}_{k-1}=\cdots=\tilde{ \boldsymbol{Q}}_{k-1}^{*} \boldsymbol{A} \tilde{ \boldsymbol{Q}}_{k-1} .	$\boldsymbol{A}_{k}=\boldsymbol{Q}_{k-1}^{*} \boldsymbol{A}_{k-1} \boldsymbol{Q}_{k-1}= \boldsymbol{Q}_{k-1}^{*} \boldsymbol{Q}_{k-2}^{*} \boldsymbol{A}_{k-2} \boldsymbol{Q}_{k-2} \boldsymbol{Q}_{k-1}=\cdots=\tilde{ \boldsymbol{Q}}_{k-1}^{*} \boldsymbol{A} \tilde{ \boldsymbol{Q}}_{k-1} .$	$\boldsymbol{A}_{k}=\boldsymbol{Q}_{k-1}^{*} \boldsymbol{A}_{k-1} \boldsymbol{Q}_{k-1}= \boldsymbol{Q}_{k-1}^{*} \boldsymbol{Q}_{k-2}^{*} \boldsymbol{A}_{k-2} \boldsymbol{Q}_{k-2} \boldsymbol{Q}_{k-1}=\cdots=\tilde{ \boldsymbol{Q}}_{k-1}^{*} \boldsymbol{A} \tilde{ \boldsymbol{Q}}_{k-1} .$
lyche-numerical-linear-algebra_EQ1046	353	1.000	\boldsymbol{A}^{k} \boldsymbol{e}_{1}=\tilde{ \boldsymbol{Q}}_{k} \tilde{\boldsymbol{R}}_{k} \boldsymbol{e}_{1}=\tilde{r}_{11}^{(k)} \tilde{ \boldsymbol{Q}}_{k} \boldsymbol{e}_{1} \text { or } \tilde{\boldsymbol{q}}_{1}^{(k)}:=\tilde{ \boldsymbol{Q}}_{k} \boldsymbol{e}_{1}=\frac{1}{ \tilde{r}_{11}^{(k)}} \boldsymbol{A}^{k} \boldsymbol{e}_{1} .	$\boldsymbol{A}^{k} \boldsymbol{e}_{1}=\tilde{ \boldsymbol{Q}}_{k} \tilde{\boldsymbol{R}}_{k} \boldsymbol{e}_{1}=\tilde{r}_{11}^{(k)} \tilde{ \boldsymbol{Q}}_{k} \boldsymbol{e}_{1} \text { or } \tilde{\boldsymbol{q}}_{1}^{(k)}:=\tilde{ \boldsymbol{Q}}_{k} \boldsymbol{e}_{1}=\frac{1}{ \tilde{r}_{11}^{(k)}} \boldsymbol{A}^{k} \boldsymbol{e}_{1} .$	$\boldsymbol{A}^{k} \boldsymbol{e}_{1}=\tilde{ \boldsymbol{Q}}_{k} \tilde{\boldsymbol{R}}_{k} \boldsymbol{e}_{1}=\tilde{r}_{11}^{(k)} \tilde{ \boldsymbol{Q}}_{k} \boldsymbol{e}_{1} \text { or } \tilde{\boldsymbol{q}}_{1}^{(k)}:=\tilde{ \boldsymbol{Q}}_{k} \boldsymbol{e}_{1}=\frac{1}{ \tilde{r}_{11}^{(k)}} \boldsymbol{A}^{k} \boldsymbol{e}_{1} .$
lyche-numerical-linear-algebra_EQ1048	355	1.000	\boldsymbol{A}_{k+1}=\boldsymbol{Q}_{k}^{*} \left(\boldsymbol{A}_{k}-s_{k} \boldsymbol{I}\right) \boldsymbol{Q}_{k}+s_{k} \boldsymbol{I}= \boldsymbol{Q}_{k}^{*} \boldsymbol{A}_{k} \boldsymbol{Q}_{k}	$\boldsymbol{A}_{k+1}=\boldsymbol{Q}_{k}^{*} \left(\boldsymbol{A}_{k}-s_{k} \boldsymbol{I}\right) \boldsymbol{Q}_{k}+s_{k} \boldsymbol{I}= \boldsymbol{Q}_{k}^{*} \boldsymbol{A}_{k} \boldsymbol{Q}_{k}$	$\boldsymbol{A}_{k+1}=\boldsymbol{Q}_{k}^{*} \left(\boldsymbol{A}_{k}-s_{k} \boldsymbol{I}\right) \boldsymbol{Q}_{k}+s_{k} \boldsymbol{I}= \boldsymbol{Q}_{k}^{*} \boldsymbol{A}_{k} \boldsymbol{Q}_{k}$
lyche-numerical-linear-algebra_EQ1050 (16.1)	358	1.000	\nabla f:=\left[\begin{array}{c} D_{1} f \\ \vdots \\ D_{n} f \end{array}\right], \quad \boldsymbol{H} f:= \nabla \nabla^{T} f:=\left[\begin{array}{ccc} D_{1} D_{1} f & \cdots & D_{1} D_{n} f \\ \vdots & & \vdots \\ D_{n} D_{1} & \cdots & D_{n} D_{n} f \end{array}\right],	$\nabla f:=\left[\begin{array}{c} D_{1} f \\ \vdots \\ D_{n} f \end{array}\right], \quad \boldsymbol{H} f:= \nabla \nabla^{T} f:=\left[\begin{array}{ccc} D_{1} D_{1} f & \cdots & D_{1} D_{n} f \\ \vdots & & \vdots \\ D_{n} D_{1} & \cdots & D_{n} D_{n} f \end{array}\right],$	$\nabla f:=\left[\begin{array}{c} D_{1} f \\ \vdots \\ D_{n} f \end{array}\right], \quad \boldsymbol{H} f:= \nabla \nabla^{T} f:=\left[\begin{array}{ccc} D_{1} D_{1} f & \cdots & D_{1} D_{n} f \\ \vdots & & \vdots \\ D_{n} D_{1} & \cdots & D_{n} D_{n} f \end{array}\right],$

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lyche-numerical-linear-algebra_EQ1051	359	1.000	`\nabla^{T} \boldsymbol{f}:=\left[\begin{array}{ccc} D_{1} f_{1} & \cdots & D_{n} f_{1} \\ \vdots & & \vdots \\ D_{1} f_{m} & \cdots & D_{n} f_{m} \end{array}\right] .`	$\nabla^T \boldsymbol{f} := \left[\begin{array}{ccc} D_1 f_1 & \cdots & D_n f_1 \\ \vdots & & \vdots \\ D_1 f_m & \cdots & D_n f_m \end{array}\right].$	$\nabla^T \boldsymbol{f} := \begin{bmatrix} D_1 f_1 & \cdots & D_n f_1 \\ \vdots & & \vdots \\ D_1 f_m & \cdots & D_n f_m \end{bmatrix}.$
lyche-numerical-linear-algebra_EQ1053 (16.2)	359	1.000	`f(\boldsymbol{x}+\boldsymbol{h})=f(\boldsymbol{x})+ \boldsymbol{h}^{T} \nabla f(\boldsymbol{x})+\frac{1}{2} \boldsymbol{h}^{T} \nabla \nabla^{T} f(\boldsymbol{c}) \boldsymbol{h}, \text { for some } \boldsymbol{c} \in L .`	$f(\boldsymbol{x}+\boldsymbol{h})=f(\boldsymbol{x})+\boldsymbol{h}^{T} \nabla f(\boldsymbol{x})+\frac{1}{2} \boldsymbol{h}^{T} \nabla \nabla^{T} f(\boldsymbol{c}) \boldsymbol{h}, \text{ for some } \boldsymbol{c} \in L.$	$f(\boldsymbol{x}+\boldsymbol{h})=f(\boldsymbol{x})+\boldsymbol{h}^{T} \nabla f(\boldsymbol{x})+\frac{1}{2} \boldsymbol{h}^{T} \nabla \nabla^{T} f(\boldsymbol{c}) \boldsymbol{h}, \text{ for some } \boldsymbol{c} \in L.$
lyche-numerical-linear-algebra_EQ1055	359	1.000	`g(1)=g(0)+g^{\prime}(0)+\frac{1}{2} g^{\prime \prime}(u), \text { for some } u \in(0,1),`	$g(1)=g(0)+g^{\prime}(0)+\frac{1}{2} g^{\prime \prime}(u), \text{ for some } u \in(0,1),$	$g(1)=g(0)+g^{\prime}(0)+\frac{1}{2} g^{\prime \prime}(u), \text{ for some } u \in(0,1),$
lyche-numerical-linear-algebra_EQ1056	360	1.000	`\begin{aligned} D_{i}\left(\boldsymbol{x}^{T} \boldsymbol{B} \boldsymbol{x}\right) & =\lim _{h \rightarrow 0} \frac{1}{h}\left(\left(\boldsymbol{x}+h \boldsymbol{e}_{i}\right)^{T} \boldsymbol{B} \left(\boldsymbol{x}+h \boldsymbol{e}_{i}\right)- \boldsymbol{x}^{T} \boldsymbol{B} \boldsymbol{x} \right) \\ & =\lim _{h \rightarrow 0}\left(\boldsymbol{e}_{i}^{T} \boldsymbol{B} \boldsymbol{x}+ \boldsymbol{x}^{T} \boldsymbol{B} \boldsymbol{e}_{i}+h \boldsymbol{e}_{i}^{T} \boldsymbol{e}_{i}\right)= \boldsymbol{e}_{i}^{T}\left(\boldsymbol{B}+ \boldsymbol{B}^{T}\right) \boldsymbol{x}, \end{aligned}`	$\begin{aligned} D_i\left(\boldsymbol{x}^T \boldsymbol{B} \boldsymbol{x}\right) & =\lim _{h \rightarrow 0} \frac{1}{h}\left(\left(\boldsymbol{x}+h \boldsymbol{e}_i\right)^T \boldsymbol{B}\left(\boldsymbol{x}+h \boldsymbol{e}_i\right)-\boldsymbol{x}^T \boldsymbol{B} \boldsymbol{x}\right) \\ & =\lim _{h \rightarrow 0}\left(\boldsymbol{e}_i^T \boldsymbol{B} \boldsymbol{x}+\boldsymbol{x}^T \boldsymbol{B} \boldsymbol{e}_i+h \boldsymbol{e}_i^T \boldsymbol{e}_i\right)=\boldsymbol{e}_i^T\left(\boldsymbol{B}+\boldsymbol{B}^T\right) \boldsymbol{x}, \end{aligned}$	$\begin{aligned} D_i(\boldsymbol{x}^T \boldsymbol{B} \boldsymbol{x}) & =\lim _{h \rightarrow 0} \frac{1}{h}\left((\boldsymbol{x}+h \boldsymbol{e}_i)^T \boldsymbol{B}(\boldsymbol{x}+h \boldsymbol{e}_i)-\boldsymbol{x}^T \boldsymbol{B} \boldsymbol{x}\right) \\ & =\lim _{h \rightarrow 0}\left(\boldsymbol{e}_i^T \boldsymbol{B} \boldsymbol{x}+\boldsymbol{x}^T \boldsymbol{B} \boldsymbol{e}_i+h \boldsymbol{e}_i^T \boldsymbol{e}_i\right)=\boldsymbol{e}_i^T(\boldsymbol{B}+\boldsymbol{B}^T) \boldsymbol{x}, \end{aligned}$