|. 证明:

将AXB的第一例(证1,2,...n)视作一个整体.记为Oti

则
$$vec(AXB) = \begin{bmatrix} d_1 \\ d_2 \\ \vdots \end{bmatrix}$$

$$X = \begin{bmatrix} 1 & 1 & 1 \\ X_1 & X_2 & \cdots & X_n \end{bmatrix} \qquad AX = \begin{bmatrix} 1 & 1 & 1 \\ AX_1 & AX_2 & \cdots & AX_n \end{bmatrix}$$

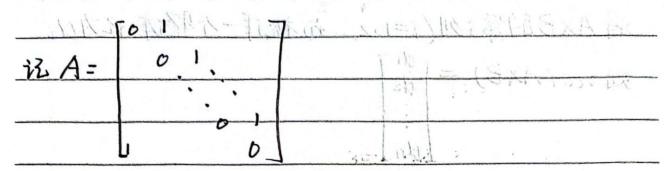
$$B = \begin{bmatrix} b_{11} & b_{12} & \cdots & b_{1n} \\ b_{21} & b_{22} & \cdots & b_{2n} \end{bmatrix}$$

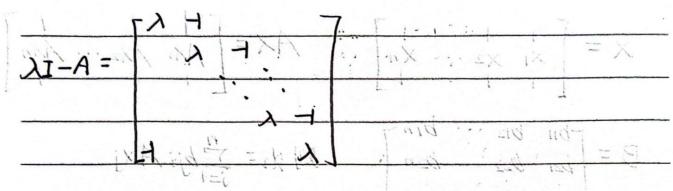
$$\begin{bmatrix} b_{11} & b_{12} & \cdots & b_{nn} \\ \vdots & \vdots & \vdots \\ \vdots & \vdots & \vdots \\ \vdots & \vdots & \vdots \\ \end{bmatrix} di = \begin{bmatrix} n \\ j = 1 \\ j = 1 \end{bmatrix} i Axj$$

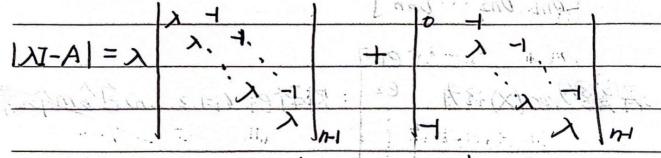
別
$$ei = \stackrel{h}{\sqsubseteq} b_j i A b_j$$
 由于 $di = ei$ ($i = 1, 2, ..., n$)

the Vec(AXB) = ($B^T \otimes A$) $vec \times a$









$$\frac{320n}{3} = \frac{3}{3} + \frac{3}{3} = \frac{3}{3} + \frac{3}{3} = \frac{3}{3} + \frac{3}{3} = \frac{3}{3} + \frac{3}{3} = \frac$$

$$|A| = \lambda |B| + |A| = \lambda |B| + |B| +$$

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$$b_{n-2} = b_{n-3} = \dots = b_2 = \begin{vmatrix} 0 & -1 \\ -1 & -1 \end{vmatrix}$$

田此所教等还值为1

当n为移数时 入目

当n为喝数时 入二土

入三1时,所辖证向量为 K

K=±1,±2,...

2-1时 所有舒征局量为 K

村土、村、

HXU THUCH

1= en | 6:0 ... N'

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4.证明 因=及=召时显然成立,下证又、己己不相争时的情 元分性: Z1+Z2+Z3-Z1Z2-Z2Z3-Z1Z3 $= (z_1 - z_2)^2 + (z_2 - z_3)^2 + z_1 z_2 + z_2 z_3 - z_2^2 - z_1 z_2$ = (3-21) + (3-21) + (3-21) (21-21) =0 放 (3-7) + 3-21 + =0 故 22-21 - 十十月元 = e 3 Ex e 3 故 |3-21 = |3-21 同理可得 | 23-21 = | 21-31 田此 | 3,- 32 = | 3-31 = | 3-21] 故 己己 双元 对一天,村成争边三角形 不妨设置, 32, 23按逆时针排列 在复项上 这 Z1-Z2 = Kei0 图 Z2-Z3= Keil0+=23 = K [ei20 + ei2(0+= 1) + ei2(0+= 2)] = k2 e 20. (1+ e 1 = + e 1 = 7)

5. HT	-v -		XI	XX2		XIXn	7
	X ₂	, ,T_	XIX	X2	,,,	X2Xn	,
X		×^ -	X.Xn	; X>X	n · ·	· X2	
	[xn]		_			21.11	1

xxT也是一个对称阵

$$A = \begin{bmatrix} Q_{11} & Q_{12} & \cdots & Q_{1n} \\ Q_{21} & Q_{22} & \cdots & Q_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ Q_{n_1} & Q_{n_2} & \cdots & Q_{n_n} \end{bmatrix} = Q_{j1}$$

$$A + xx^{T} = \begin{bmatrix} Q_{11} + X_{1}^{2} & Q_{12} + X_{1}X_{2} & Q_{21} + X_{2}X_{1} \\ Q_{21} + X_{1}X_{2} & Q_{22} + X_{2}^{2} & Q_{2n} + X_{2}X_{1} \end{bmatrix}$$

$$\begin{bmatrix} Q_{11} + X_{1}X_{1} & Q_{12} + X_{2}X_{1} & Q_{2n} + X_{2}X_{1} \\ \vdots & \vdots & \vdots \\ Q_{n1} + X_{1}X_{1} & Q_{n2} + X_{2}X_{1} & Q_{nn} + X_{n}^{2} \end{bmatrix}$$

$$(A + XX^T)^T = A^T + XX^T = A + XX^T$$

效A+XXT是对称阵 效+x((A+XXT))即A+XXT中所有元素的平方本。

 $tr((A+XX^T)^2) = \sum_{1 \leq i,j \leq n, i,j \in \mathbb{Z}} (Qij + XiXj)^2$

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$$\frac{\partial f}{\partial x_{k}} = 4 \left[x_{k} (x_{1}^{2} + x_{2}^{2} + \dots + x_{n}^{2}) + \sum_{i=1}^{n} a_{ki} x_{i} \right]$$

$$\frac{\partial f}{\partial x} = \begin{bmatrix} \frac{\partial f}{\partial x_1} \\ \frac{\partial f}{\partial x_2} \end{bmatrix} = 4\left((x^Tx)x + Ax\right)$$

$$\frac{\partial f}{\partial x_1} = 4\left((x^Tx)x + Ax\right)$$

$$\frac{\partial f}{\partial x_2} = \frac{\partial f}{\partial x_2} = 4\left((x^Tx)x + Ax\right)$$