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BWSI-UAV Linear Algebra Self-Assessment

1. $S = \begin{pmatrix} a & b \\ b & c \end{pmatrix}$

$A - xI = \begin{pmatrix} a-x & b \\ b & c-x \end{pmatrix}$ $\det(A-xI) = (a-x)(c-x) - b^2$

$ac - ax - cx + x^2 - b^2$

a) $= x^2 + (-a-c)x + (ac-b^2)$

b) $x^2 - (a+c)x + (ac-b^2) = 0$

$$x = \frac{a+c \pm \sqrt{a^2 - 2ac + c^2 + 4b^2}}{2}$$

c) ?

Differential equations:

1. $A = \begin{pmatrix} 3 & -1 \\ 3 & -2 \end{pmatrix} \Rightarrow \begin{pmatrix} 3-x & -1 \\ 3 & -2-x \end{pmatrix}$

$\det = (3-x)(-2-x) + 3$

$-6 - 3x + 2x + x^2 + 3$

$x^2 - x - 3 = 0$

$$x_{1,2} = \frac{1 \pm \sqrt{13}}{2}$$

$$\lambda_1 = \frac{1 + \sqrt{13}}{2} \qquad \lambda_2 = \frac{1 - \sqrt{13}}{2}$$