$(8\lambda+\quad)(\lambda-\quad)$

$Ax = \lambda I x$

$-8+4\lambda-16\lambda+8\lambda^2$

$8\lambda^2-12\lambda-8$

3. Consider the following matrix A:

$1(2-\lambda-0)[2-4-4\lambda)2]$

$$A = \begin{bmatrix} 0-\lambda & 1 & 2 \\ 1 & 1-\lambda & 0 \\ 4 & 2 & 2-\lambda \end{bmatrix}$$

$(2-\lambda)(\frac{-1}{2}+\lambda)-8$

$\begin{bmatrix} 1 & 2 \\ 1 & 4 \end{bmatrix} - \begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$

$-1 \quad 2$

$1 \quad 2$

For each value of λ given below determine if it is an eigenvalue of A.

a) $\lambda = 0$ $\boxed{NO}$ **b)** $\lambda = -1$ $\boxed{NO}$ **c)** $\lambda = -2$ $\boxed{NO}$

$$\left(\begin{array}{ccc|c} 0 & 1 & 2 & 0 \\ 1 & 1 & 0 & 0 \\ 4 & 2 & 2 & 0 \end{array}\right) \cdot -4$$

$$\left[\begin{array}{ccc|c} 1 & 1 & 2 & 0 \\ 1 & 2 & 0 & 0 \\ 4 & 2 & 3 & 0 \end{array}\right] \cdot -1,\ \cdot -4$$

$$\left[\begin{array}{ccc|c} -2 & 1 & 2 & 0 \\ 1 & -1 & 0 & 0 \\ 4 & 2 & 0 & 0 \end{array}\right] \cdot 2,\ \cdot -4$$

$\begin{bmatrix} -2 & 2 \\ 1 & \end{bmatrix}$ $\begin{bmatrix} 1-\lambda & 2 \\ 1 & 4-\lambda \end{bmatrix}$

$\lambda^2-5\lambda+4+2$

$\lambda^2-5\lambda+6$

$(\lambda-3)(\lambda-2)$

$\lambda = 2, 3$

$$\begin{array}{ccc|c} 1 & 1 & 0 & 0 \\ 0 & 1 & 2 & 0 \\ 0 & -2 & 2 & 0 \end{array} \cdot 2$$

$$\left[\begin{array}{ccc|c} 1 & 1 & 2 & 0 \\ 0 & 1 & -2 & 0 \\ 0 & -2 & -5 & 0 \end{array}\right] \cdot 2$$

$$\begin{array}{cccc} 0 & 1 & -2 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{array} \cdot 1$$

$= \lambda A$

$Ax = 2x$

$$\begin{array}{ccc|c} 1 & 0 & 2 & 0 \\ 0 & 1 & 2 & 0 \\ 0 & 0 & 1 & 0 \end{array} \cdot -1,\ \cdot 2$$

$$\begin{array}{cccc} 1 & 1 & 2 & 0 \\ 0 & 1 & -2 & 0 \\ 0 & 0 & 1 & 0 \end{array}$$

$$\begin{array}{cccc} 1 & 0 & -2 & 0 \\ 0 & 1 & -2 & 0 \\ 0 & 1 & 0 & 0 \end{array} \cdot -1$$

$Ax = \lambda x$

$-2 \quad 2 \quad 0$

$1 \quad 1 \quad 0$

yes free

$x_1 = 0$, $x_2 = 0$, $x_3 = 0$

$x_1 + x_2 + 2x_3 = 0 \quad x_1 = x_2 + 2x_3$

$x_2 - 2x_3 = 0 \quad x_2 = 2x_3$

$x_3 = 0$ $\begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$

NO because $A\begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix} = 2\begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$

eigenvector can't be $\emptyset$

?

$$\begin{array}{cccc} 1 & 0 & -2 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -12 & 0 \end{array}$$

NO because $\begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$ can't be $\emptyset$,

$\boxed{No}$

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0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20