Week3_discussion

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$C11.$*Find the characteristic Polinomial of the matrix* $A = \begin{pmatrix} 3 & 2 & 1 \\ 0 & 1 & 1 \\ 1 & 2 & 0 \end{pmatrix}$

$P(A(x)) = det(A - xI)$
$= det(\begin{pmatrix} 3 & 2 & 1 \\ 0 & 1 & 1 \\ 1 & 2 & 0 \end{pmatrix} - x \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 1 & 2 & 0 \end{pmatrix})$
$= det(\begin{pmatrix} 3-x & 2 & 1 \\ 0 & 1-x & 1 \\ 1 & 2 & -x \end{pmatrix})$
$= (3-x)(-x+x^2-2) + 2 + (x-1)$
$= -x^3 + 4x^2 - 5$
$= (x+1)(-x^2+5x-5)$
$= -(x+1)(x^2-5x+5)$