

MATH 54 – SOLUTION TO 5.2.11

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Using Bomberman and expanding along the first row, we get that the characteristic polynomial of A is:

$$\begin{aligned}\det(\lambda I - A) &= \begin{vmatrix} \lambda - 3 & 0 & 0 \\ -2 & \lambda - 1 & -4 \\ -1 & 0 & \lambda - 4 \end{vmatrix} \\ &= (\lambda - 3) \begin{vmatrix} \lambda - 1 & -4 \\ 0 & \lambda - 4 \end{vmatrix} \\ &= (\lambda - 3)(\lambda - 1)(\lambda - 4) \\ &= (\lambda - 1)(\lambda - 3)(\lambda - 4)\end{aligned}$$