For Characteristic Eq

$$\begin{bmatrix} 2 & 3 \\ 3 & 5 \end{bmatrix}$$

For 2x2 matrix

$$\lambda^2 - (\text{trace of } A)\lambda + \det A = 0.$$

$$\lambda^2 - 7\lambda + 1 = 0$$

For 3x3 matrix

$$\lambda^3 - (\text{trace } A)\lambda^2 + (\text{sum of minor along diagonal})\lambda - \det A = 0$$

Q
$$\begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$$

$M_{11} = 6$

$M_{22} = -1$

$M_{33} = 2$

$$\lambda^3 - 6\lambda^2 + (6 - 1 + 2)\lambda + 2 = 0$$

$$\Rightarrow \lambda^3 - 6\lambda^2 + 7\lambda + 2 = 0$$