

`n = {{11, 2, 3}, {4, 15, 6}, {7, 8, 19}}`

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`CharacteristicPolynomial[n, x]`

`-x3 + 45 x2 - 582 x + 2320`

`-(45 MatrixPower[n, 2]) + MatrixPower[n, 3] - 2320 IdentityMatrix[3] + 582 n`

`{{0, 0, 0}, {0, 0, 0}, {0, 0, 0}}`

`MatrixForm[n]`

$$\begin{pmatrix} 11 & 2 & 3 \\ 4 & 15 & 6 \\ 7 & 8 & 19 \end{pmatrix}$$

`Det[n]`

`2320`

`Inverse[n]`

$$\left\{ \left\{ \frac{237}{2320}, -\frac{7}{1160}, -\frac{33}{2320} \right\}, \left\{ -\frac{17}{1160}, \frac{47}{580}, -\frac{27}{1160} \right\}, \left\{ -\frac{73}{2320}, -\frac{37}{1160}, \frac{157}{2320} \right\} \right\}$$

$$\frac{\text{MatrixPower}[n, 2]}{2320} + \frac{582 \text{IdentityMatrix}[3]}{2320} - \frac{45 n}{2320}$$

$$\left\{ \left\{ \frac{237}{2320}, -\frac{7}{1160}, -\frac{33}{2320} \right\}, \left\{ -\frac{17}{1160}, \frac{47}{580}, -\frac{27}{1160} \right\}, \left\{ -\frac{73}{2320}, -\frac{37}{1160}, \frac{157}{2320} \right\} \right\}$$