

Pensieve header: Verifying properties of the minors of an adjoint matrix.

```
In[ ]:= (A = Table[RandomInteger[{-3, 3}], {5}, {5}]) // MatrixForm
```

Out[]//MatrixForm=

$$\begin{pmatrix} 0 & 0 & 1 & -3 & 1 \\ -2 & 2 & -1 & 0 & -2 \\ -1 & -1 & 1 & 0 & -3 \\ 1 & -1 & 1 & 3 & 0 \\ 3 & 1 & 2 & 1 & 0 \end{pmatrix}$$

```
In[ ]:= ω = Det[A]
```

Out[]:= -120

```
In[ ]:= Inverse[A] // MatrixForm
```

Out[]//MatrixForm=

$$\begin{pmatrix} -\frac{1}{2} & -\frac{2}{5} & \frac{1}{10} & -\frac{3}{5} & \frac{3}{10} \\ \frac{1}{6} & \frac{23}{60} & -\frac{1}{5} & \frac{7}{60} & \frac{3}{20} \\ \frac{2}{3} & \frac{1}{3} & 0 & \frac{2}{3} & 0 \\ 0 & \frac{3}{20} & -\frac{1}{10} & \frac{7}{20} & -\frac{1}{20} \\ \frac{1}{3} & \frac{7}{60} & -\frac{3}{10} & \frac{23}{60} & -\frac{3}{20} \end{pmatrix}$$

```
In[ ]:= Minors[Inverse[A], 3] // MatrixForm
```

Out[]//MatrixForm=

$$\begin{pmatrix} 0 & \frac{1}{40} & -\frac{3}{40} & -\frac{1}{60} & \frac{1}{20} & 0 & -\frac{1}{120} & \frac{1}{40} & \frac{3}{40} & -\frac{1}{20} \\ 0 & -\frac{1}{20} & \frac{1}{40} & \frac{1}{30} & -\frac{1}{60} & \frac{1}{24} & \frac{1}{60} & -\frac{1}{120} & \frac{1}{30} & -\frac{1}{120} \\ \frac{1}{24} & \frac{1}{120} & -\frac{1}{40} & \frac{1}{120} & -\frac{1}{40} & 0 & \frac{7}{120} & -\frac{1}{20} & \frac{1}{40} & \frac{1}{40} \\ 0 & \frac{1}{40} & \frac{1}{40} & -\frac{1}{60} & -\frac{1}{60} & \frac{1}{15} & -\frac{1}{120} & -\frac{1}{120} & \frac{1}{120} & \frac{1}{60} \\ -\frac{1}{30} & \frac{1}{120} & -\frac{1}{40} & \frac{1}{60} & -\frac{1}{20} & 0 & -\frac{1}{40} & -\frac{1}{40} & \frac{1}{40} & \frac{1}{20} \\ \frac{1}{40} & -\frac{1}{40} & 0 & -\frac{1}{24} & \frac{1}{120} & -\frac{1}{120} & -\frac{1}{120} & -\frac{1}{120} & \frac{1}{120} & \frac{1}{60} \\ 0 & -\frac{3}{40} & \frac{1}{40} & \frac{1}{20} & -\frac{1}{60} & \frac{1}{30} & \frac{1}{40} & -\frac{1}{120} & -\frac{1}{120} & \frac{1}{60} \\ \frac{1}{15} & -\frac{1}{120} & \frac{1}{40} & \frac{1}{60} & -\frac{1}{20} & 0 & \frac{3}{40} & -\frac{1}{40} & -\frac{1}{40} & \frac{1}{20} \\ -\frac{1}{120} & \frac{1}{24} & -\frac{1}{60} & -\frac{1}{120} & \frac{1}{120} & -\frac{1}{40} & \frac{1}{40} & -\frac{1}{120} & -\frac{1}{120} & \frac{1}{60} \\ -\frac{1}{30} & \frac{1}{60} & -\frac{1}{60} & \frac{1}{15} & 0 & -\frac{1}{30} & 0 & 0 & 0 & 0 \end{pmatrix}$$

```
In[ ]:= Det[A]^-2 Minors[Det[A] Inverse[A], 3] // MatrixForm
```

Out[]//MatrixForm=

$$\begin{pmatrix} 0 & -3 & 9 & 2 & -6 & 0 & 1 & -3 & -9 & 6 \\ 0 & 6 & -3 & -4 & 2 & -5 & -2 & 1 & -4 & 1 \\ -5 & -1 & 3 & -1 & 3 & 0 & -7 & 6 & -3 & -3 \\ 0 & -3 & -3 & 2 & 2 & -8 & 1 & 1 & -1 & -2 \\ 4 & -1 & 3 & -2 & 6 & 0 & 3 & 3 & -3 & -6 \\ -3 & 3 & 0 & 5 & -1 & 1 & 1 & 1 & -1 & -2 \\ 0 & 9 & -3 & -6 & 2 & -4 & -3 & 1 & 1 & -2 \\ -8 & 1 & -3 & -2 & 6 & 0 & -9 & 3 & 3 & -6 \\ 1 & -5 & 2 & 1 & -1 & 3 & -3 & 1 & 1 & -2 \\ 4 & -2 & 2 & -8 & 0 & 4 & 0 & 0 & 0 & 0 \end{pmatrix}$$