In[75]:=
```
A = {{1, 2}, {3, 4}};
B = {{4, 3}, {2, 1}};
SUM = A + B;
SUM // MatrixForm
```

Out[78]//MatrixForm=

$$\begin{pmatrix} 5 & 5 \\ 5 & 5 \end{pmatrix}$$

In[79]:=
```
MULTI = A.B;
MULTI // MatrixForm
```

Out[80]//MatrixForm=

$$\begin{pmatrix} 8 & 5 \\ 20 & 13 \end{pmatrix}$$

In[81]:=
```
M = {{1, 2, 3}, {4, 5, 6}};
TRANS = Transpose[M];
TRANS // MatrixForm
```

Out[83]//MatrixForm=

$$\begin{pmatrix} 1 & 4 \\ 2 & 5 \\ 3 & 6 \end{pmatrix}$$

In[84]:=
```
DET = Det[A];
DET
```

Out[85]=

```
-2
```

In[86]:=
```
Q = {{4, 7}, {2, 6}};
INV = Inverse[Q];
INV // MatrixForm
```

Out[88]//MatrixForm=

$$\begin{pmatrix} \frac{3}{5} & -\frac{7}{10} \\ -\frac{1}{5} & \frac{2}{5} \end{pmatrix}$$

In[119]:=
```
TRACE = Tr[A];
TRACE
NORM = Norm[A];
N[NORM, 3]
```

Out[120]=

```
5
```

Out[122]=

```
5.46
```

In[154]:=

```
Z = {{2, 1, -1}, {-3, -1, 2}, {-2, 1, 2}};
RowReduce[Z] // MatrixForm
```

Out[155]//MatrixForm=

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

In[156]:=

```
M = {{1, 2, 3}, {4, 5, 6}, {7, 8, 9}};
MatrixRank[M]
```

Out[157]=

2

In[162]:=

```
A.A // MatrixForm
MatrixPower[A, -1] // MatrixForm
```

Out[162]//MatrixForm=

$$\begin{pmatrix} 7 & 10 \\ 15 & 22 \end{pmatrix}$$

Out[163]//MatrixForm=

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

In[166]:=

```
k = {{4, 7}, {2, 6}};
MatrixPower[Transpose[k], -1] // MatrixForm
```

Out[167]//MatrixForm=

$$\begin{pmatrix} \frac{3}{5} & -\frac{1}{5} \\ -\frac{7}{10} & \frac{2}{5} \end{pmatrix}$$

In[168]:=

```
A1 = {{1, 2}, {3, 4}};
A2 = {{5, 6}, {7, 8}};
Inverse[A1.A2] // MatrixForm
```

Out[170]//MatrixForm=

$$\begin{pmatrix} \frac{25}{2} & -\frac{11}{2} \\ -\frac{43}{4} & \frac{19}{4} \end{pmatrix}$$

In[171]:=

```
MatrixPower[MatrixPower[A, -1], 6] // MatrixForm
```

Out[171]//MatrixForm=

$$\begin{pmatrix} \frac{9149}{32} & -\frac{4185}{32} \\ -\frac{12\,555}{64} & \frac{5743}{64} \end{pmatrix}$$

In[106]:=