

```
a = {{-2, 3, 1}, {3, 4, -1}}
```

```
{{-2, 3, 1}, {3, 4, -1}}
```

```
MatrixForm[a]
```

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

```
b = {{4, 0, -1}, {1, -1, 2}}
```

```
{{-2, 3, 1}, {3, 4, -1}}
```

```
{{4, 0, -1}, {1, -1, 2}}
```

```
MatrixForm[b]
```

$$\begin{pmatrix} 4 & 0 & -1 \\ 1 & -1 & 2 \end{pmatrix}$$

```
a + a // MatrixForm
```

$$\begin{pmatrix} -4 & 6 & 2 \\ 6 & 8 & -2 \end{pmatrix}$$

```
b - b // MatrixForm
```

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

```
3 a // MatrixForm
```

$$\begin{pmatrix} -6 & 9 & 3 \\ 9 & 12 & -3 \end{pmatrix}$$

```
a.b // MatrixForm
```

Dot::dotsh: Tensors {{-2, 3, 1}, {3, 4, -1}} and {{4, 0, -1}, {1, -1, 2}} have incompatible shapes. >>

```
{{-2, 3, 1}, {3, 4, -1}}.{{4, 0, -1}, {1, -1, 2}}
```

```
b2 // MatrixForm
```

$$\begin{pmatrix} 16 & 0 & 1 \\ 1 & 1 & 4 \end{pmatrix}$$

```
IdentityMatrix[4] // MatrixForm
```

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

```
DiagonalMatrix[{x, y, z, s}] // MatrixForm
```

$$\begin{pmatrix} x & 0 & 0 & 0 \\ 0 & y & 0 & 0 \\ 0 & 0 & z & 0 \\ 0 & 0 & 0 & s \end{pmatrix}$$

```
c = {{1, 2, 3}, {2, -1, -3}, {7, 8, -9}}
```

```
{1, 2, 3}, {2, -1, -3}, {7, 8, -9}}
```

```
Inverse[c] // MatrixForm
```

$$\begin{pmatrix} \frac{11}{32} & \frac{7}{16} & -\frac{1}{32} \\ -\frac{1}{32} & -\frac{5}{16} & \frac{3}{32} \\ \frac{23}{96} & \frac{1}{16} & -\frac{5}{96} \end{pmatrix}$$

```
Transpose[c] // MatrixForm
```

$$\begin{pmatrix} 1 & 2 & 7 \\ 2 & -1 & 8 \\ 3 & -3 & -9 \end{pmatrix}$$

```
c = {{1, 2, 3}, {2, -1, -3}, {7, 8, -9}}
```

```
{1, 2, 3}, {2, -1, -3}, {7, 8, -9}}
```

```
Det[c]
```

```
96
```

```
MatrixForm[c]
```

$$\begin{pmatrix} 1 & 2 & 3 \\ 2 & -1 & -3 \\ 7 & 8 & -9 \end{pmatrix}$$

```
c[[2]]
```

```
{2, -1, -3}
```

```
c[[2, 3]]
```

```
-3
```

```
c[[3]] = 2 * c[[2]] - c[[1]]
```

```
{3, -4, -9}
```