In[1]:= **A = {{0, 2, 1}, {1, 0, 2}, {1, 2, 0}}** --This is how you enter a matrix

Out[1]= {{0, 2, 1}, {1, 0, 2}, {1, 2, 0}}

In[2]:= **A // MatrixForm** --This is how you make it look like a matrix

Out[2]//MatrixForm=

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

In[3]:= **B = {{1, 2, 4, 1}, {3, 4, 5, 1}, {4, 5, 6, 1}}**

Out[3]= {{1, 2, 4, 1}, {3, 4, 5, 1}, {4, 5, 6, 1}}

In[4]:= **B // MatrixForm**

Out[4]//MatrixForm=

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

In[6]:= **u = {1, 2, 3}**

Out[6]= {1, 2, 3}

In[7]:= **v = {5, 2, 1}**

Out[7]= {5, 2, 1}

In[9]:= **A.B // MatrixForm** --Matrix multiplication

Out[9]//MatrixForm=

$$\begin{pmatrix} 10 & 13 & 16 & 3 \\ 9 & 12 & 16 & 3 \\ 7 & 10 & 14 & 3 \end{pmatrix}$$

In[11]:= **A.u // MatrixForm**

Out[11]//MatrixForm=

$$\begin{pmatrix} 7 \\ 7 \\ 5 \end{pmatrix}$$

In[13]:= **RowReduce[A] // MatrixForm**

Out[13]//MatrixForm=

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

In[14]:= **RowReduce[B] // MatrixForm**

Out[14]//MatrixForm=

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

In[16]:=
```
Inverse[A] // MatrixForm
```

Out[16]//MatrixForm=

$$\begin{pmatrix} -\frac{2}{3} & \frac{1}{3} & \frac{2}{3} \\ \frac{1}{3} & -\frac{1}{6} & \frac{1}{6} \\ \frac{1}{3} & \frac{1}{3} & -\frac{1}{3} \end{pmatrix}$$

In[17]:=
```
Transpose[B] // MatrixForm
```

Out[17]//MatrixForm=

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

In[18]:=
```
Eigenvalues[A]
```

Out[18]=
```
{3, -2, -1}
```

In[20]:=
```
Eigenvectors[A]
```

Out[20]=
```
{{1, 1, 1}, {2, -3, 2}, {-3, 1, 1}}
```