

In [1]:

```
A=matrix([[2,3,1],[1,2,3],[3,1,2]])  
show(A)
```

Out[1]:

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

In [2]:

```
b=vector([11,11,14]).column()  
show(b)
```

Out[2]:

$$\begin{pmatrix} 11 \\ 11 \\ 14 \end{pmatrix}$$

In [3]:

```
show(A.adjugate())  
# Adjoint of matrix A
```

Out[3]:

$$\begin{pmatrix} 1 & -5 & 7 \\ 7 & 1 & -5 \\ -5 & 7 & 1 \end{pmatrix}$$

In [4]:

```
det(A)
```

Out[4]:

18

In [5]:

```
show(A.adjugate()/det(A))
```

Out[5]:

$$\begin{pmatrix} \frac{1}{18} & -\frac{5}{18} & \frac{7}{18} \\ \frac{7}{18} & \frac{1}{18} & -\frac{5}{18} \\ -\frac{5}{18} & \frac{7}{18} & \frac{1}{18} \end{pmatrix}$$

In [6]:

```
#double check  
show(A^(-1))
```

Out[6]:

$$\begin{pmatrix} \frac{1}{18} & -\frac{5}{18} & \frac{7}{18} \\ \frac{7}{18} & \frac{1}{18} & -\frac{5}{18} \\ -\frac{5}{18} & \frac{7}{18} & \frac{1}{18} \end{pmatrix}$$

In [7]:

```
show(A^(-1)*b)
```

Out[7]:

$$\begin{pmatrix} 3 \\ 1 \\ 2 \end{pmatrix}$$

In [8]:

```
#double check  
var('x,y,z')  
solve([2*x+3*y+z==11, x+2*y+3*z==11, 3*x+y+2*z==14], [x,y,z])
```

Out[8]:

```
[[x == 3, y == 1, z == 2]]
```

In [0]: