1. 1 2 -3 5

   2 1 -3 13

   -1 1 0 -8

   This matrix has to be row-reduced to echelon form.

   First we add the first row to the third row and also multiply it by 2 and subtract it from the second row.

   1 2 -3 5

   0 -3 3 3

   0 3 -3 -3

   Next, we divide the second and third row by -3.

   1 2 -3 5

   0 1 -1 -1

   0 1 -1 -1

   The final row can be eliminated.

   1 2 -3 5

   0 1 -1 -1

   Next, we multiply the second row by 2 and subtract it from the first row.

   1 0 -1 7

   0 1 -1 -1

   We get the following solutions:

   z = arbitrary

   x = 7 + z

   y = -1 + z

2. $A = \begin{matrix} 4 & -3 \\ -3 & 5 \\ 0 & 1 \end{matrix}$ $B = \begin{matrix} 1 & 4 \\ 3 & -2 \end{matrix}$

To obtain the first element:

(4*1) + (-3*3) = -5

To obtain the second element:

(4*4) + (-3*-2) = 22

To obtain the third element:

(-3*1) + (5*3) = 12

To obtain the fourth element:

(-3*4) + (5*-2) = -22

To obtain the fifth element:

(0*1) + (3*1) = 3

To obtain the sixth element:

(0*4) + (1*-2) = -2

$AB = \begin{matrix} -5 & 22 \\ 12 & 22 \\ 3 & -2 \end{matrix}$