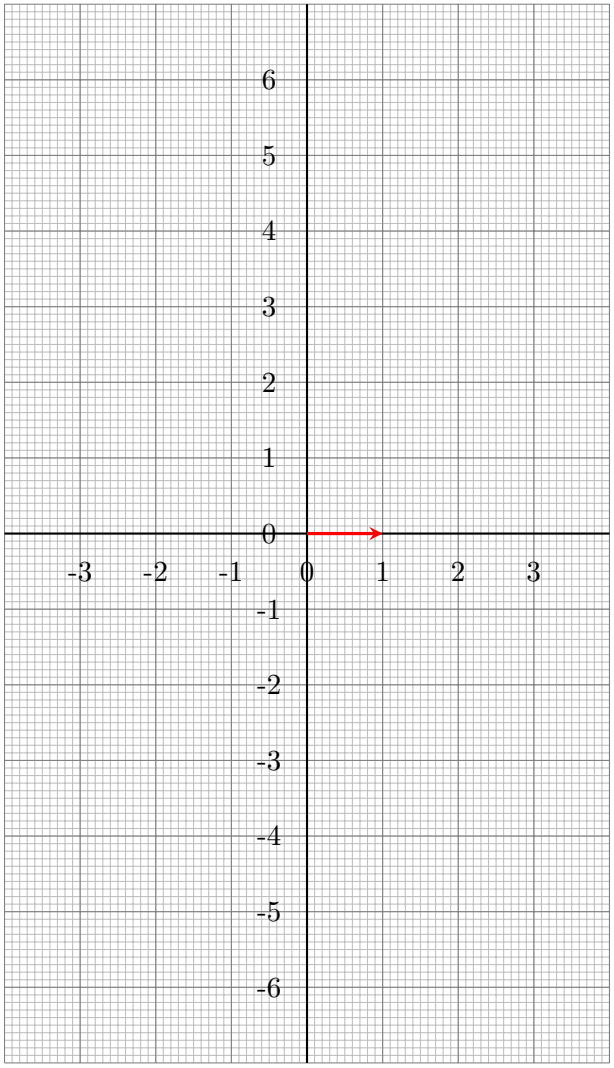
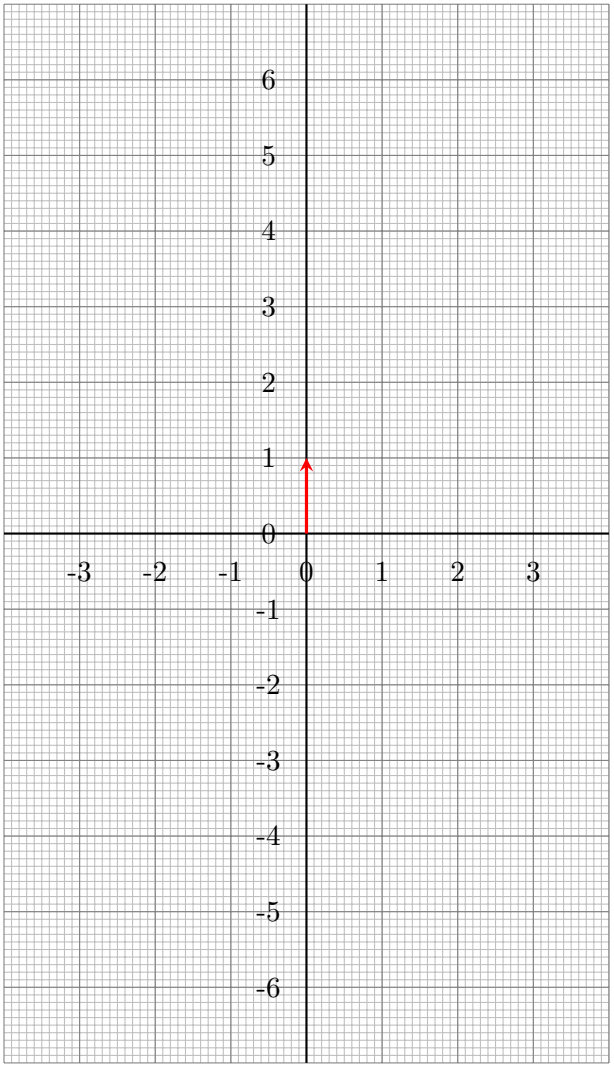
Write in the form $a\mathbf{i} + b\mathbf{j}$:

a)



i

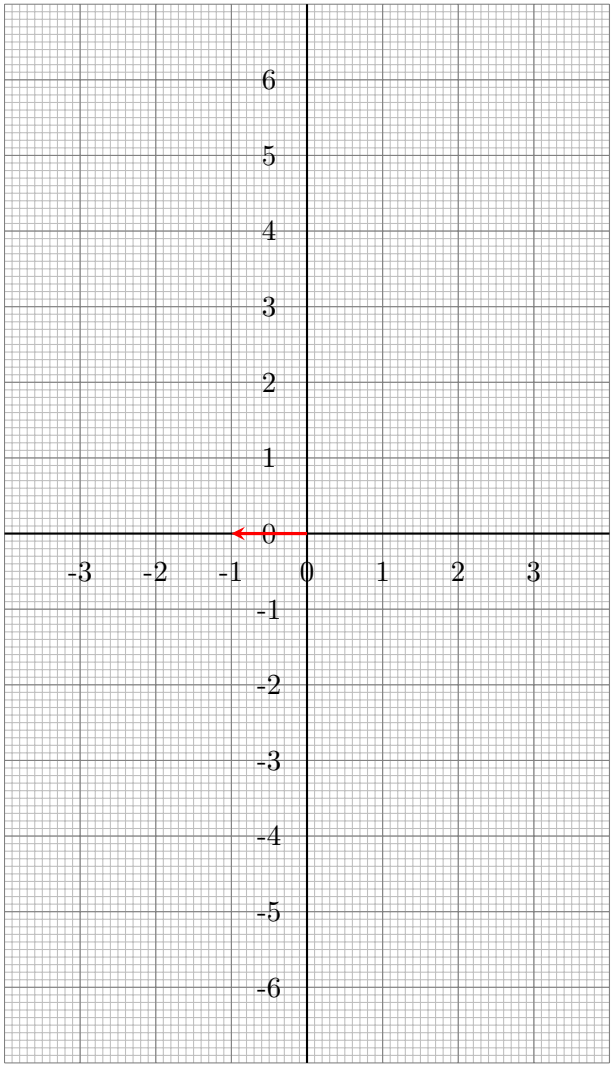
b)



j

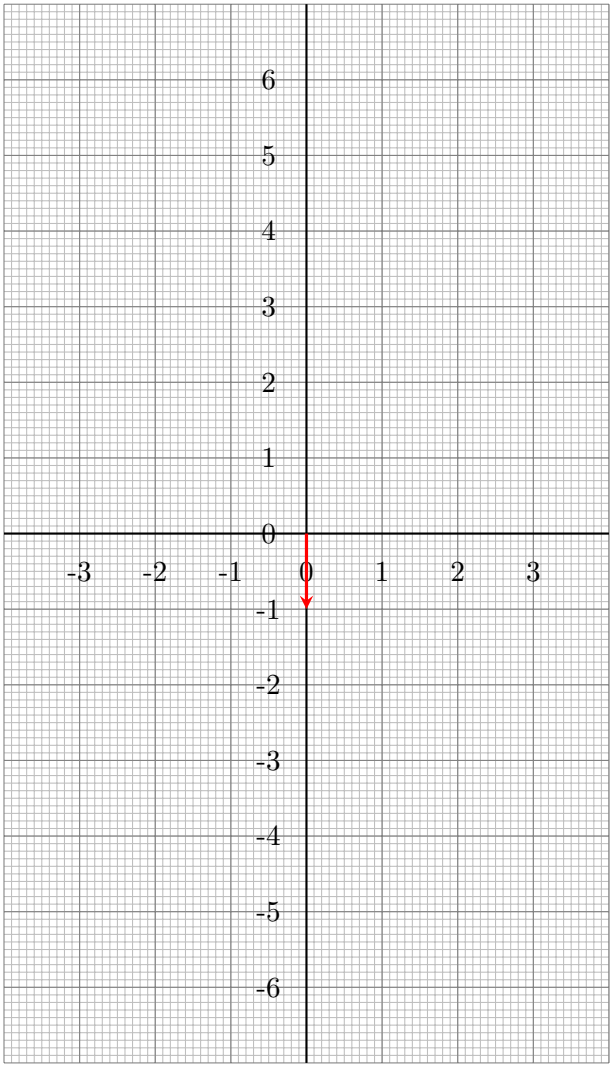
Write in the form $a\mathbf{i} + b\mathbf{j}$:

a)



$-\mathbf{i}$

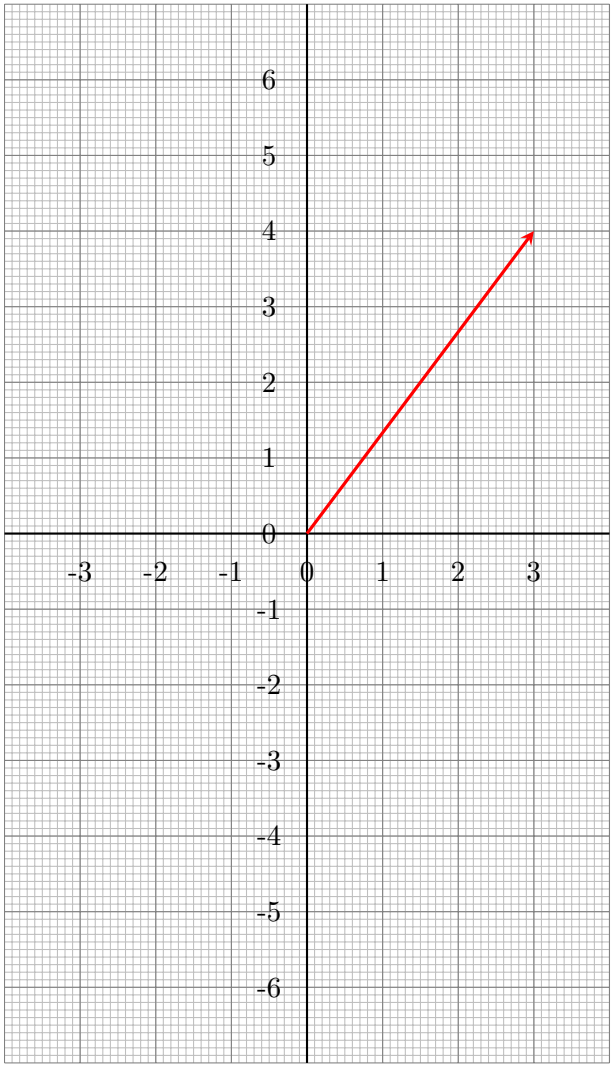
b)



$-\mathbf{j}$

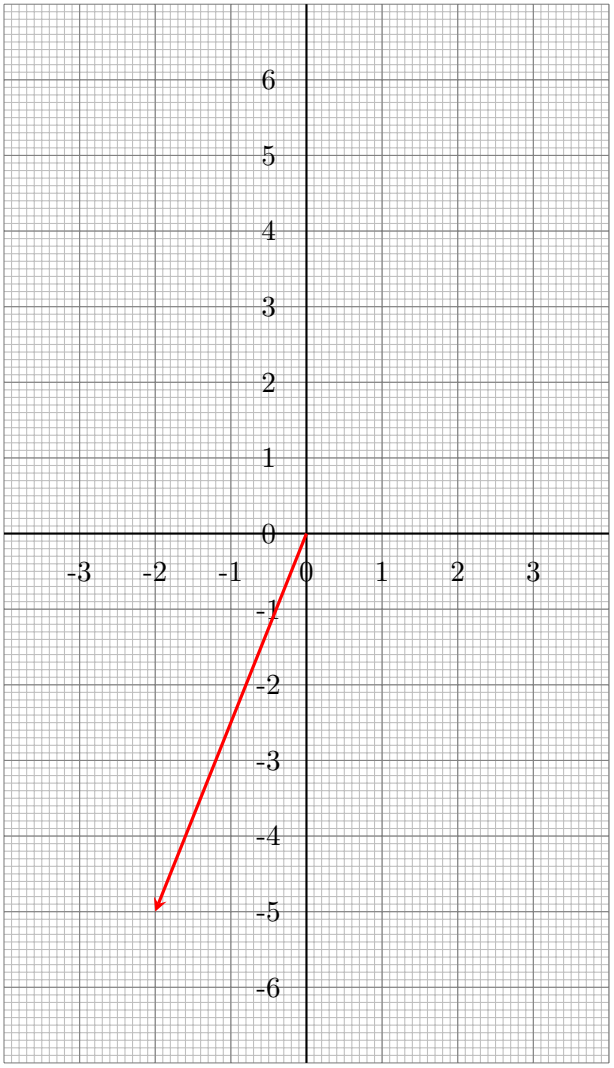
Write in the form $a\mathbf{i} + b\mathbf{j}$:

a)



$3\mathbf{i} + 4\mathbf{j}$

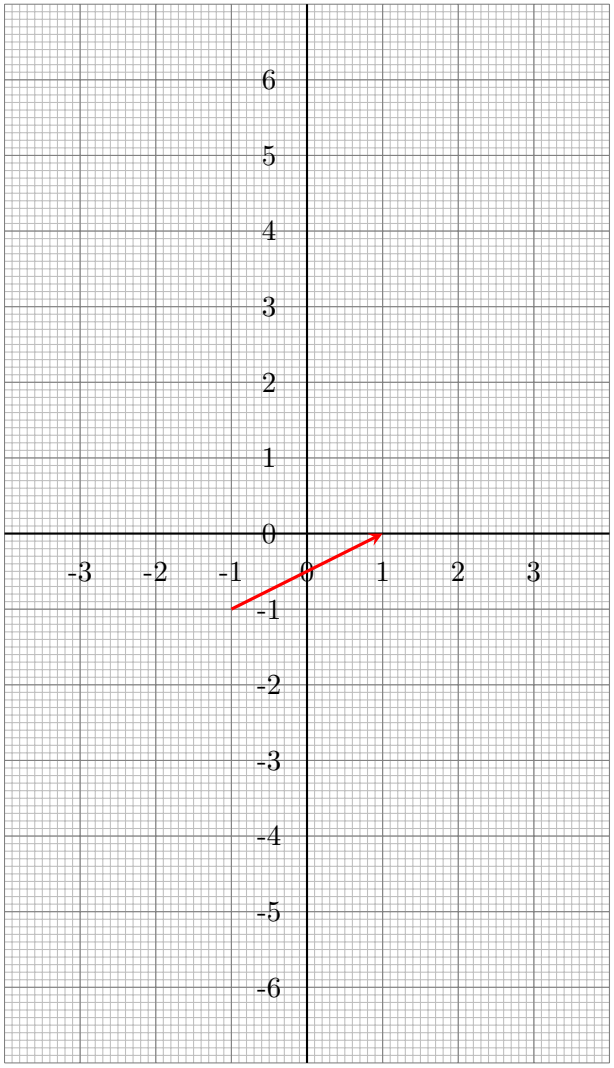
b)



$-2\mathbf{i} - 5\mathbf{j}$

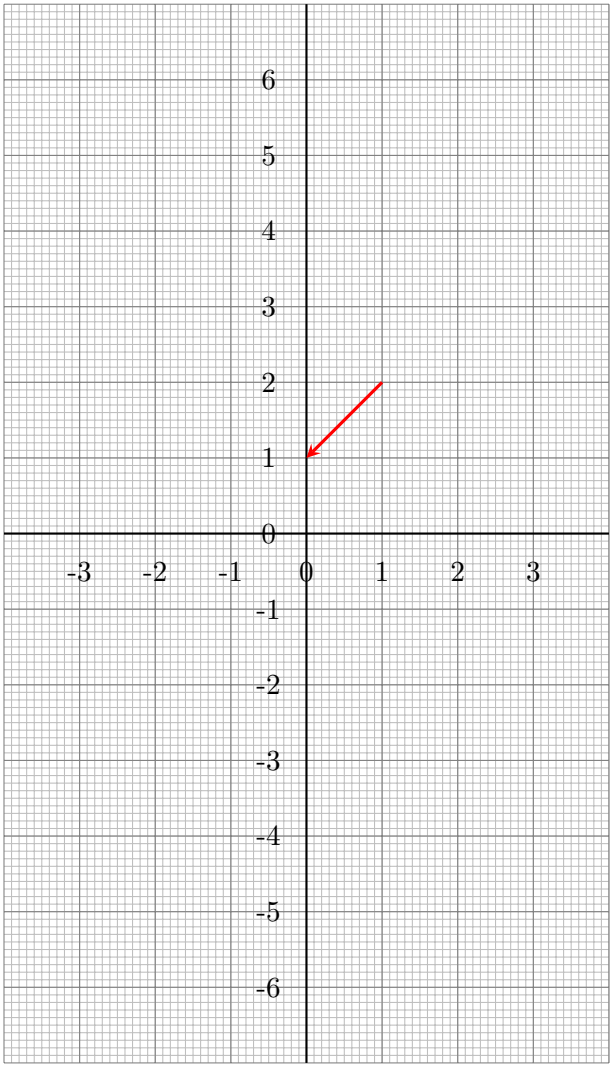
Write in the form $a\mathbf{i} + b\mathbf{j}$:

a)



$2\mathbf{i} + j$

b)



$-\mathbf{i} - \mathbf{j}$

Write as column vectors:

a) $3\mathbf{i} + 4\mathbf{j}$ $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$

b) $3\mathbf{i}$ $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$

c) $-4\mathbf{j}$ $\begin{pmatrix} 0 \\ -4 \end{pmatrix}$

d) $-3\mathbf{i} + \mathbf{j}$ $\begin{pmatrix} -3 \\ 1 \end{pmatrix}$

e) $3.1234\mathbf{i}$ $\begin{pmatrix} 3.1234 \\ 0 \end{pmatrix}$

f) $-\mathbf{j}$ $\begin{pmatrix} 0 \\ -1 \end{pmatrix}$

Work out the matrix calculations

a) $\begin{pmatrix} 4 \\ -2 \end{pmatrix} + \begin{pmatrix} -3 \\ -1 \end{pmatrix} \quad \begin{pmatrix} 1 \\ -3 \end{pmatrix}$

b) $\begin{pmatrix} 14 \\ -2 \end{pmatrix} - \begin{pmatrix} 23 \\ 1 \end{pmatrix} \quad \begin{pmatrix} -9 \\ -3 \end{pmatrix}$

c) $4\begin{pmatrix} 4 \\ -2 \end{pmatrix} + 2\begin{pmatrix} -3 \\ -1 \end{pmatrix} \quad \begin{pmatrix} 10 \\ -10 \end{pmatrix}$

d) $-2\begin{pmatrix} 14 \\ -2 \end{pmatrix} - \begin{pmatrix} 23 \\ 1 \end{pmatrix} \quad \begin{pmatrix} -51 \\ 3 \end{pmatrix}$

e) $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} + \begin{pmatrix} 5 & 6 \\ 7 & 8 \end{pmatrix} \quad \begin{pmatrix} 6 & 8 \\ 10 & 12 \end{pmatrix}$

f) $\begin{pmatrix} 1 & -2 \\ 3 & -4 \end{pmatrix} + \begin{pmatrix} -5 & 6 \\ -7 & 8 \end{pmatrix} \quad \begin{pmatrix} -4 & 4 \\ -4 & 4 \end{pmatrix}$

Work out the matrix calculations

a) $-2\begin{pmatrix}1 & 2\\ 3 & 4\end{pmatrix}+3\begin{pmatrix}5 & 6\\ 7 & 8\end{pmatrix}\quad\begin{pmatrix}13 & 14\\ 15 & 16\end{pmatrix}$

b) $-\begin{pmatrix}1 & -2\\ 3 & -4\end{pmatrix}-\begin{pmatrix}-5 & 6\\ -7 & 8\end{pmatrix}\quad\begin{pmatrix}4 & -4\\ 4 & -4\end{pmatrix}$

c) $-2\begin{pmatrix}1 & 2a\\ 3b & 4\end{pmatrix}+3\begin{pmatrix}5 & 6c\\ 7 & 8\end{pmatrix}\quad\begin{pmatrix}13 & 18c-4a\\ 21-6b & 16\end{pmatrix}$

d) $-x\begin{pmatrix}1 & -2\\ 3 & -4\end{pmatrix}-\begin{pmatrix}-5 & 6\\ -7 & 8\end{pmatrix}\quad\begin{pmatrix}-x+5 & 2x-6\\ -3x+7 & 4x-8\end{pmatrix}$

e) $\begin{pmatrix}1 & 2\\ 3 & 4\end{pmatrix}\begin{pmatrix}5\\ 7\end{pmatrix}\quad\begin{pmatrix}19\\ 43\end{pmatrix}$

f) $\begin{pmatrix}1 & -2\\ 3 & -4\end{pmatrix}\begin{pmatrix}-2\\ 0\end{pmatrix}\quad\begin{pmatrix}-2\\ -6\end{pmatrix}$

Work out the matrix calculations

a) $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} \quad \begin{pmatrix} x+2y \\ 3x+4y \end{pmatrix}$

b) $\begin{pmatrix} 1 & -2 \\ 3 & -4 \end{pmatrix} \begin{pmatrix} -2x+2 \\ z \end{pmatrix} \quad \begin{pmatrix} -2x+2-2z \\ -6x+6-4z \end{pmatrix}$

c) $\begin{pmatrix} 1 & 2 \end{pmatrix} \begin{pmatrix} 3 \\ 4 \end{pmatrix} \quad 11$

d) $\begin{pmatrix} 1 & -2 \end{pmatrix} \begin{pmatrix} -2x \\ z \end{pmatrix} \quad -2x-2z$

e) $\begin{pmatrix} 1 & 2 \end{pmatrix} \begin{pmatrix} x & 4 \\ y & 7 \end{pmatrix} \quad \begin{pmatrix} x+2y & 18 \end{pmatrix}$

f) $\begin{pmatrix} 1 & -2 \end{pmatrix} \begin{pmatrix} -2 & 2 \\ -15 & 3 \end{pmatrix} \quad \begin{pmatrix} 28 & -4 \end{pmatrix}$

Work out the matrix calculations

a) $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} 5 & 6 \\ 7 & 8 \end{pmatrix} \quad \begin{pmatrix} 19 & 22 \\ 43 & 50 \end{pmatrix}$

b) $\begin{pmatrix} 1 & -2 \\ 3 & -4 \end{pmatrix} \begin{pmatrix} -5 & 6 \\ -7 & 8 \end{pmatrix} \quad \begin{pmatrix} 9 & -10 \\ 13 & -14 \end{pmatrix}$

c) $\begin{pmatrix} 1 & 0 \\ 1 & 2 \end{pmatrix} \begin{pmatrix} 0 & 1 \\ 2 & 1 \end{pmatrix} \begin{pmatrix} 3 & 1 \\ 0 & 2 \end{pmatrix}$ *answer*

d) $\begin{pmatrix} 1 & -2 \\ 1 & 2 \end{pmatrix} \begin{pmatrix} -1 & 0 \\ -1 & 2 \end{pmatrix} \begin{pmatrix} 3 & 0 \\ 1 & 1 \end{pmatrix}$ *answer*

e) $\begin{pmatrix} 5 & 6 \\ 7 & 8 \end{pmatrix} \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$ *answer*

f) $\begin{pmatrix} -5 & 6 \\ -7 & 8 \end{pmatrix} \begin{pmatrix} 1 & -2 \\ 3 & -4 \end{pmatrix}$ *answer*

Write down the order of each matrix

a) $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$ 2×2

b) $\begin{pmatrix} 1 & -2 \end{pmatrix}$ 1×2

c) $\begin{pmatrix} 1 \\ 3 \end{pmatrix}$ 2×1

d) $\begin{pmatrix} 1 & -2 & 3 \\ 5 & 6 & 7 \end{pmatrix}$ 2×3

Work out the values of x and y

a) $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 5 \\ 11 \end{pmatrix}$ $x = 1, y = 2$

b) $\begin{pmatrix} 1 & -2 \\ -3 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -3 \\ 7 \end{pmatrix}$ $x = -1, y = 1$

Work out the matrix multiplications

a) $\begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \quad \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$

b) $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \quad \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$

c) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \quad \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$

d) $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \quad \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$