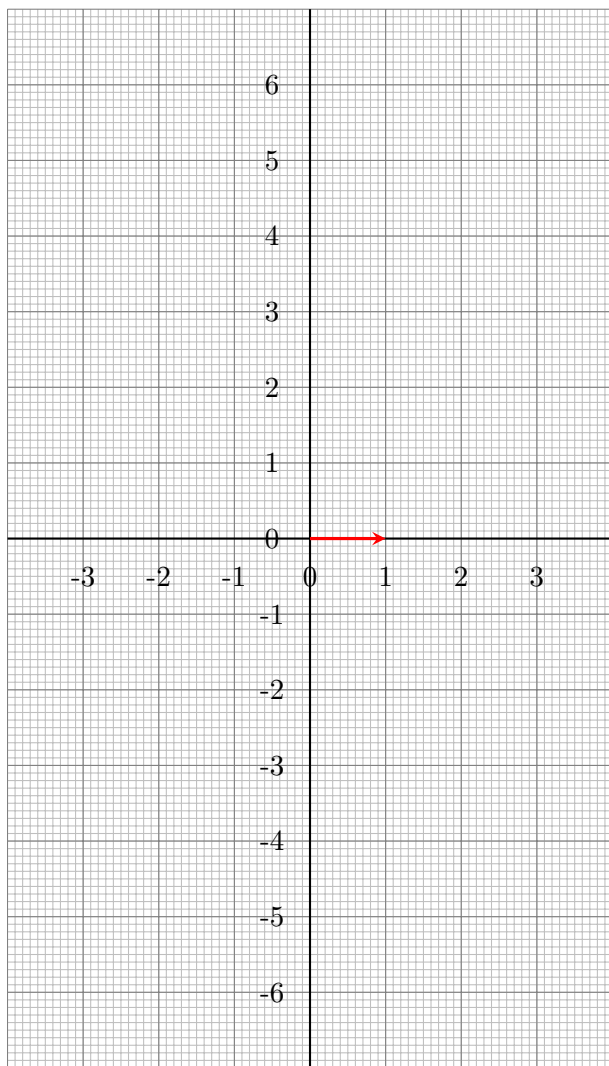
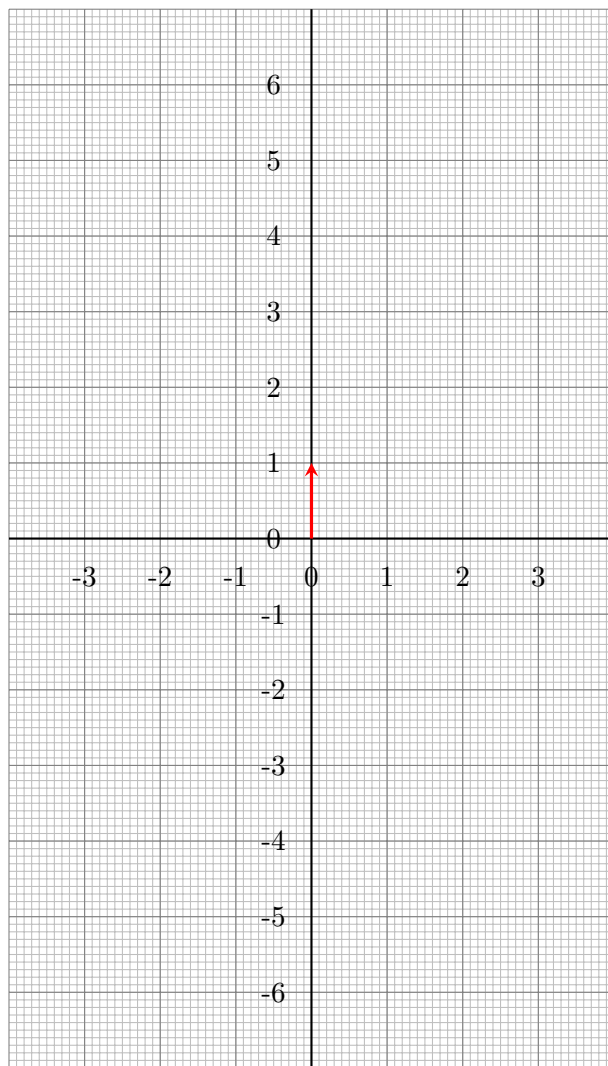


Write in the form $ai + bj$:

a)
i

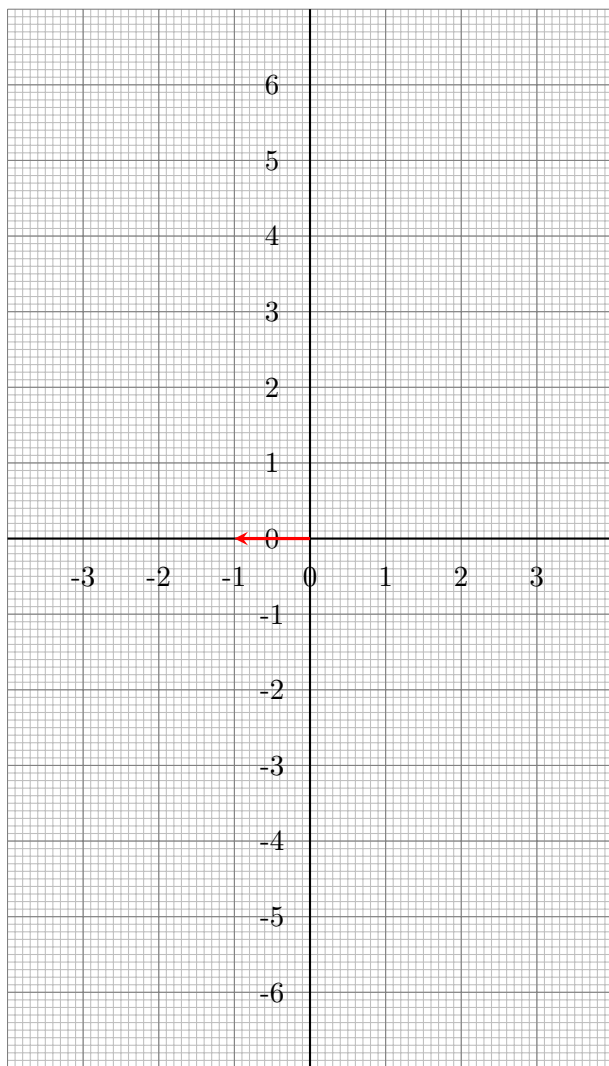


b)
j

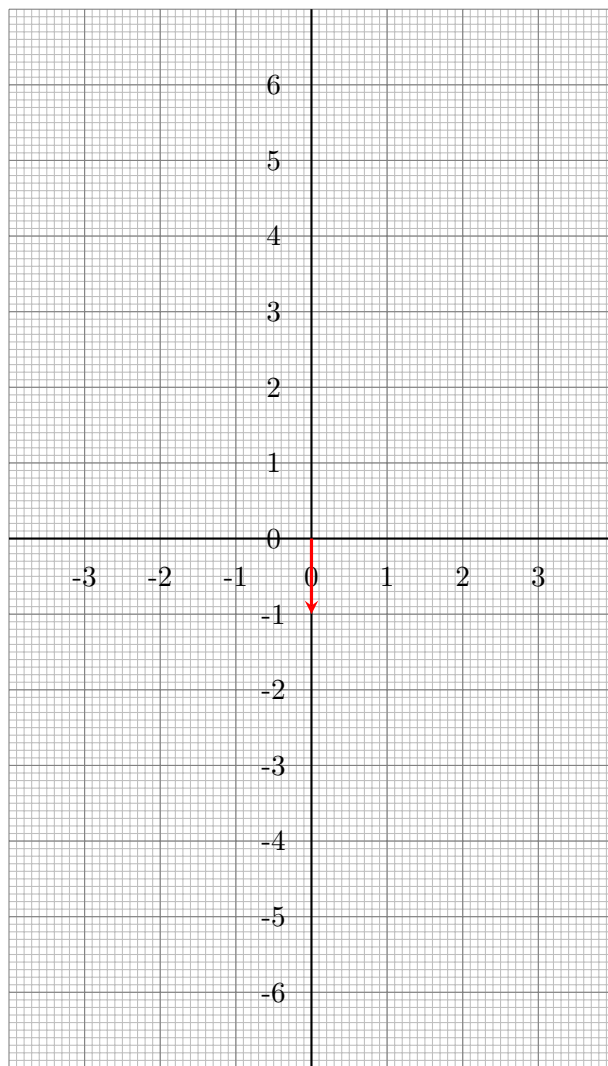


Write in the form $ai + bj$:

a)
 $-i$

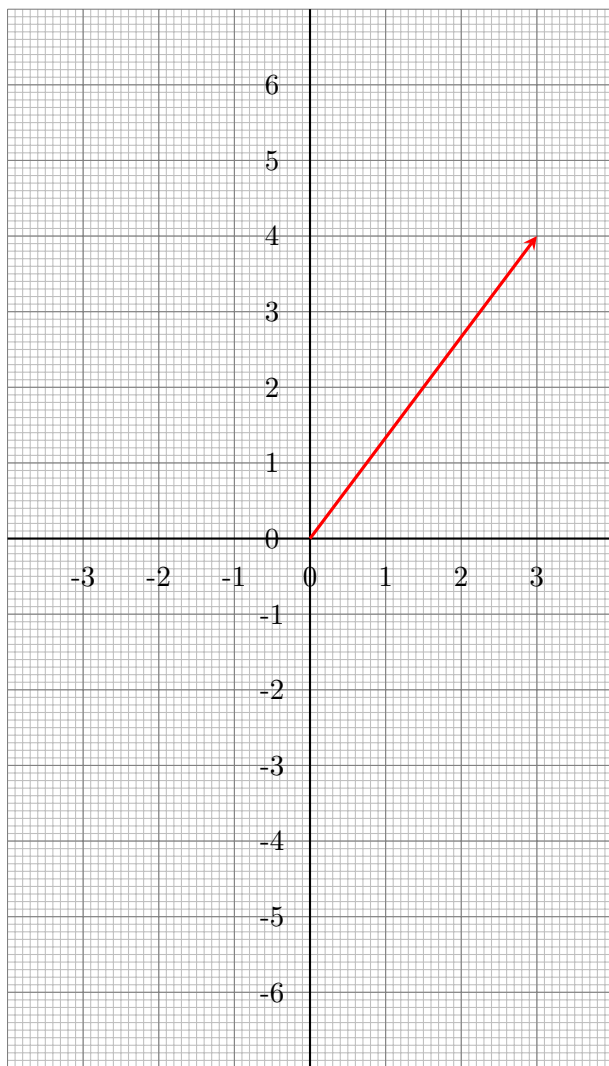


b)
 $-j$

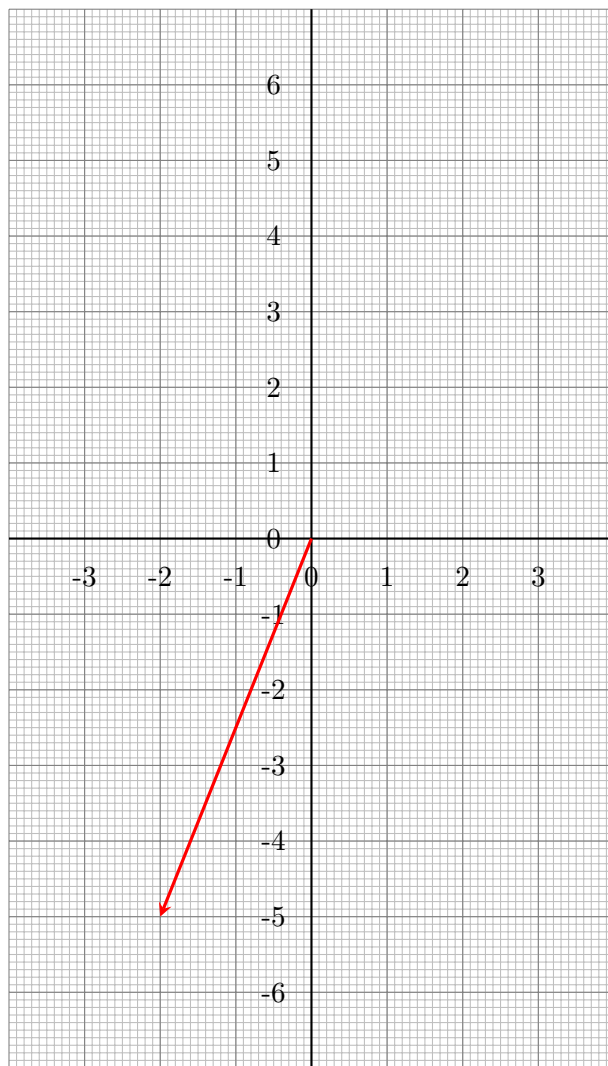


Write in the form $ai + bj$:

a)
 $3i + 4j$

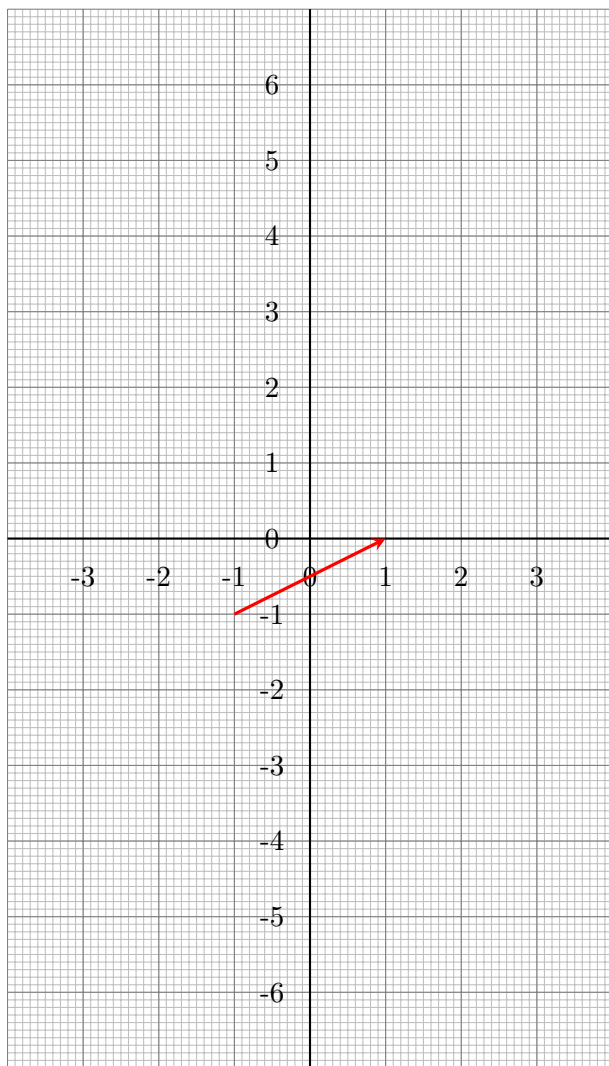


b)
 $-2i - 5j$

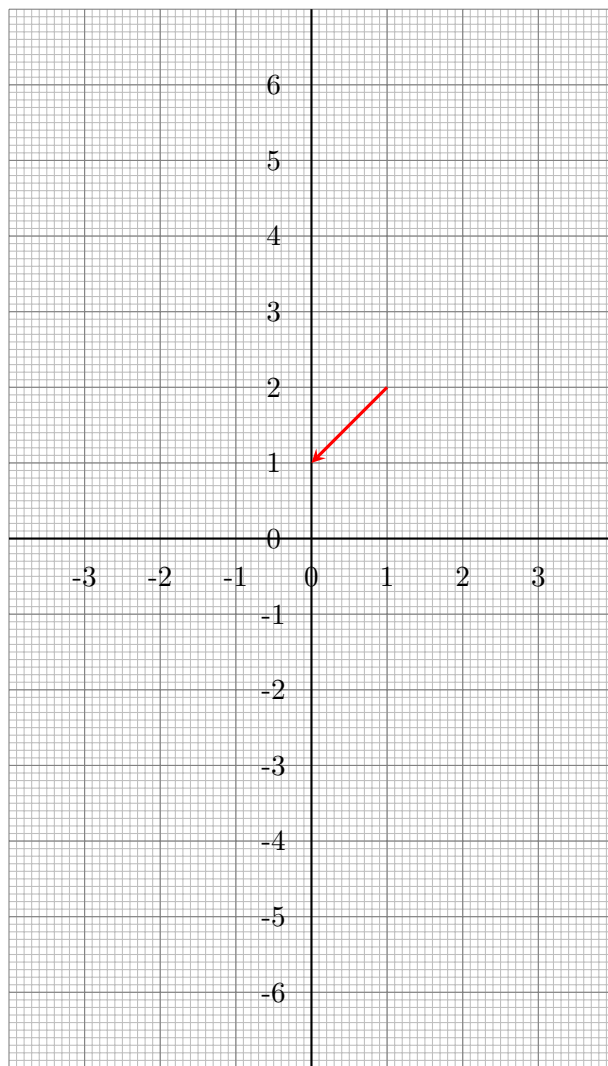


Write in the form $a\mathbf{i} + b\mathbf{j}$:

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

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

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

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

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

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

Work out the matrix calculations

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

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

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

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

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

Work out the matrix calculations

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

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

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

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

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

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

Work out the matrix calculations

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

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