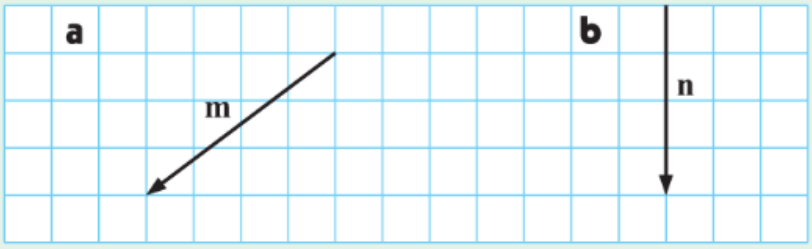
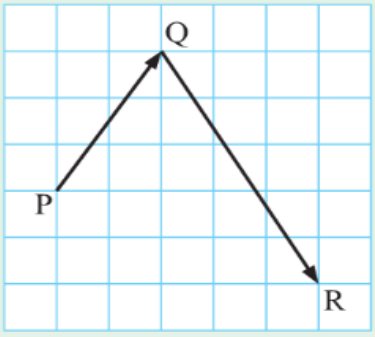
1 On grid paper, draw the vectors $\mathbf{p} = \begin{pmatrix} 2 \\ 4 \end{pmatrix}$, $\mathbf{q} = \begin{pmatrix} -3 \\ -1 \end{pmatrix}$, and $\mathbf{r} = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$.

2 Write in the form $\begin{pmatrix} x \\ y \end{pmatrix}$:



3 **a** Write $\overrightarrow{PQ}$ and $\overrightarrow{QR}$ in component form.

b Find $|\overrightarrow{PQ}|$ and $|\overrightarrow{QR}|$.



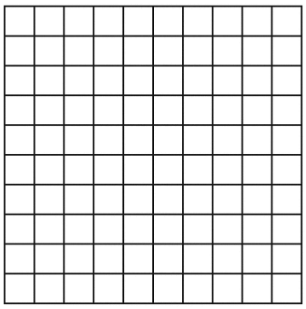
4 Find:

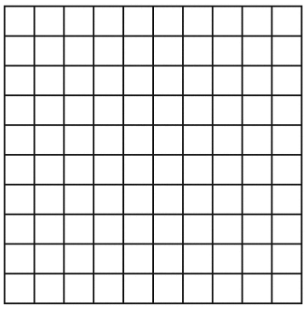
a $\begin{pmatrix} 5 \\ 4 \end{pmatrix} + \begin{pmatrix} 6 \\ -3 \end{pmatrix}$ **b** $\begin{pmatrix} 7 \\ -1 \end{pmatrix} - \begin{pmatrix} -3 \\ 2 \end{pmatrix}$ **c** $\begin{pmatrix} 8 \\ 2 \end{pmatrix} + \begin{pmatrix} 3 \\ 4 \end{pmatrix} - \begin{pmatrix} 5 \\ -1 \end{pmatrix}$

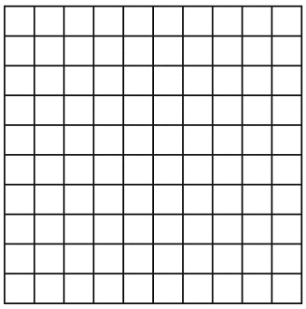
Algebraically AND graphically

5 Suppose $\mathbf{a} = \begin{pmatrix} 6 \\ -5 \end{pmatrix}$. Find:

a $3\mathbf{a}$ **b** $-2\mathbf{a}$ **c** $-\mathbf{a}$ **d** $0\mathbf{a}$





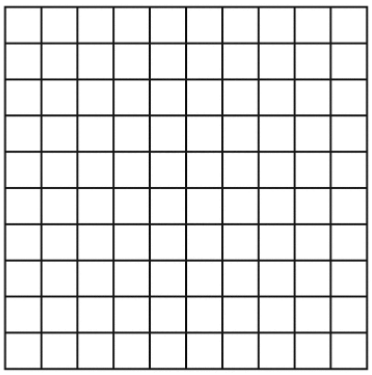


6 Suppose $\mathbf{d} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$ and $\mathbf{e} = \begin{pmatrix} -2 \\ 2 \end{pmatrix}$.

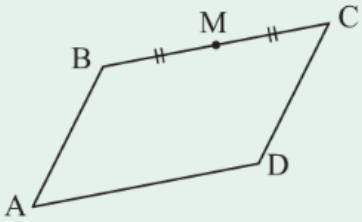
a Draw a vector diagram to illustrate $\mathbf{d} - \mathbf{e}$.

b Find $\mathbf{d} - \mathbf{e}$ in component form.

c Find: **i** $2\mathbf{e} + 3\mathbf{d}$ **ii** $4\mathbf{d} - 3\mathbf{e}$



7



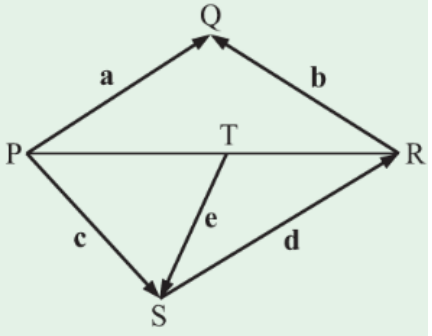
$\overrightarrow{AB} = \mathbf{p}$, $\overrightarrow{BC} = \mathbf{q}$, and ABCD is a parallelogram. Find a vector expression for:

a $\overrightarrow{CD}$ **b** $\overrightarrow{BM}$ **c** $\overrightarrow{MD}$ **d** $\overrightarrow{AD}$

8 Find in terms of **a**, **b**, **c**, **d**, and **e**:

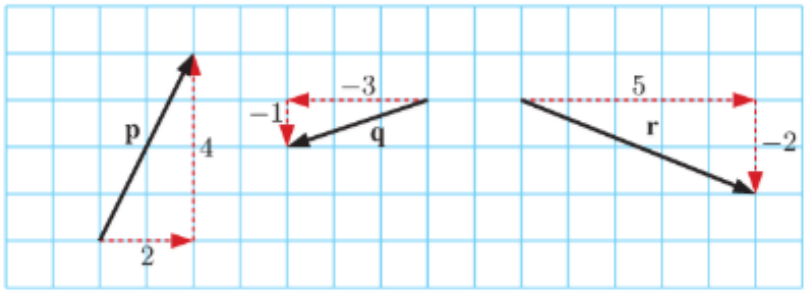
a $\overrightarrow{TR}$ **b** $\overrightarrow{PR}$

c $\overrightarrow{PT}$ **d** $\overrightarrow{TQ}$



REVIEW SET 26B

1



2 **a** $\mathbf{m} = \begin{pmatrix} -4 \\ -3 \end{pmatrix}$ **b** $\mathbf{n} = \begin{pmatrix} 0 \\ -4 \end{pmatrix}$

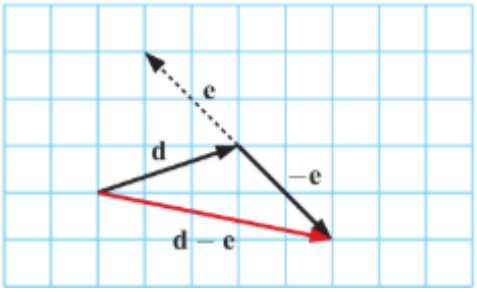
3 **a** $\overrightarrow{PQ} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$, $\overrightarrow{QR} = \begin{pmatrix} 3 \\ -5 \end{pmatrix}$

b $|\overrightarrow{PQ}| = \sqrt{13}$ units, $|\overrightarrow{QR}| = \sqrt{34}$ units

4 **a** $\begin{pmatrix} 11 \\ 1 \end{pmatrix}$ **b** $\begin{pmatrix} 10 \\ -3 \end{pmatrix}$ **c** $\begin{pmatrix} 6 \\ 7 \end{pmatrix}$

5 **a** $\begin{pmatrix} 18 \\ -15 \end{pmatrix}$ **b** $\begin{pmatrix} -12 \\ 10 \end{pmatrix}$ **c** $\begin{pmatrix} -6 \\ 5 \end{pmatrix}$ **d** $\begin{pmatrix} 0 \\ 0 \end{pmatrix}$

6 **a**



b $\mathbf{d} - \mathbf{e} = \begin{pmatrix} 5 \\ -1 \end{pmatrix}$ **c** **i** $\begin{pmatrix} 5 \\ 7 \end{pmatrix}$ **ii** $\begin{pmatrix} 18 \\ -2 \end{pmatrix}$

7 **a** $-\mathbf{p}$ **b** $\frac{1}{2}\mathbf{q}$ **c** $\frac{1}{2}\mathbf{q} - \mathbf{p}$ **d** $\mathbf{q}$

8 **a** $\overrightarrow{TR} = \mathbf{e} + \mathbf{d}$ **b** $\overrightarrow{PR} = \mathbf{c} + \mathbf{d}$ **c** $\overrightarrow{PT} = \mathbf{c} - \mathbf{e}$

d $\overrightarrow{TQ} = \mathbf{e} + \mathbf{d} + \mathbf{b}$