

Mark schemes

Q1.

(a) $2x + 4y$ or $4y + 2x$

B1

(b) their $(2x + 4y) \times 1.5$ oe

M1

$3x + 6y$ or $3(x + 2y)$

ft if vector answer in (a)

A1 ft

[3]

Q2.

$$\begin{pmatrix} 1 \\ -10 \end{pmatrix}$$

B1

[1]

Q3.

$$\begin{pmatrix} -5 \\ -3 \end{pmatrix}$$

B1

[1]

Q4.

(a) $\frac{3}{2} \text{ s}$

Accept $1\frac{1}{2} \text{ s}$ or 1.5s or $3\text{s} \div 2$ or $\text{s} + 0.5\text{s}$ or $\text{s} + \frac{1}{2} \text{ s}$

B1

(b) $-\mathbf{s} + \mathbf{t}$ + their $1.5\mathbf{s}$

M1

$\mathbf{t} + 0.5\mathbf{s}$

oe

ft their part (a)

A1 ft

[3]

Q5.

$$\begin{pmatrix} 12 \\ 15 \end{pmatrix} \text{ or } \begin{pmatrix} 10 \\ -4 \end{pmatrix} \text{ or } \begin{pmatrix} -10 \\ 4 \end{pmatrix}$$

M1

$$\begin{pmatrix} 2 \\ 19 \end{pmatrix}$$

SC1 Answer $\begin{pmatrix} 2 \\ y \end{pmatrix}$ or $\begin{pmatrix} x \\ 19 \end{pmatrix}$

A1

[2]

Q6.

$$(\vec{AB} =) \mathbf{b} - \mathbf{a}$$

(a) or $(\vec{BA} =) \mathbf{a} - \mathbf{b}$
oe

M1

$$\mathbf{a} + \frac{1}{2}(\mathbf{b} - \mathbf{a})$$

$$\text{or } \mathbf{b} - \frac{1}{2}(\mathbf{b} - \mathbf{a})$$

oe

M1dep

$$\frac{1}{2}\mathbf{a} + \frac{1}{2}\mathbf{b} \text{ or } \frac{1}{2}(\mathbf{a} + \mathbf{b})$$

Do not ignore fw

A1

Additional Guidance

$\mathbf{a} - \mathbf{b}$ or $\mathbf{b} - \mathbf{a}$ as final answer with no working shown

M0 M0 A0

(b) $-\frac{1}{2}\mathbf{a} - \frac{1}{2}\mathbf{b}$ or $-\frac{1}{2}(\mathbf{a} + \mathbf{b})$

ft their answer in part (a), even if unsimplified. Answer must be a valid vector

B1ft

Additional Guidance

Do not condone missing brackets eg $\mathbf{b} - \mathbf{a} \div 2$ in part (a) followed by $\mathbf{a} - \mathbf{b} \div 2$ in part (b)

[4]

Q7.

$$6\mathbf{b} - 2\mathbf{a}$$

$$2\mathbf{a} - 6\mathbf{b}$$

M1

$$2\mathbf{a} + \frac{1}{2}(6\mathbf{b} - 2\mathbf{a})$$

oe

$$6\mathbf{b} - \frac{1}{2}(6\mathbf{b} - 2\mathbf{a})$$

M1dep

$$2\mathbf{a} + 3\mathbf{b} - \mathbf{a}$$

$$6\mathbf{b} + \mathbf{a} - 3\mathbf{b}$$

M1dep

$$\mathbf{a} + 3\mathbf{b}$$

$$3\mathbf{b} + \mathbf{a}$$

A1

[4]