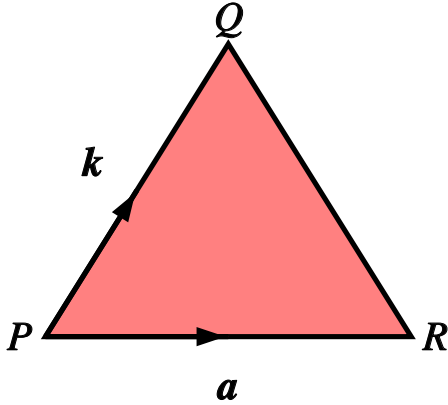


Vector Geometry

Name: _____ Class: _____ Date: _____

Mark _____ / 15 %

1) Triangle PQR is shown below where $\vec{PQ} = \mathbf{k}$ and $\vec{PR} = \mathbf{a}$.



Express the following vectors in terms of \mathbf{k} and \mathbf{a} .

a) \vec{PQ}

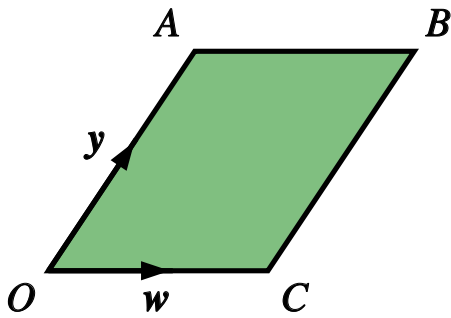
b) \vec{RP}

c) \vec{QR}

d) \vec{RQ}

[1]

2) OABC is a parallelogram where $\vec{OA} = \mathbf{y}$ and $\vec{OC} = \mathbf{w}$.



Express the following vectors in terms of \mathbf{y} and \mathbf{w} .

a) \vec{AB}

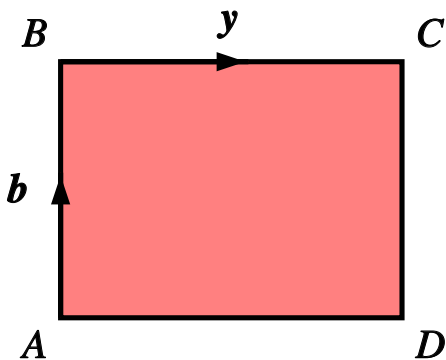
b) \vec{BC}

c) \vec{OB}

d) \vec{AC}

[1]

3) ABCD is a rectangle where $\vec{AB} = \mathbf{b}$ and $\vec{BC} = \mathbf{y}$.



Express the following vectors in terms of \mathbf{b} and \mathbf{y} .

a) \vec{AD}

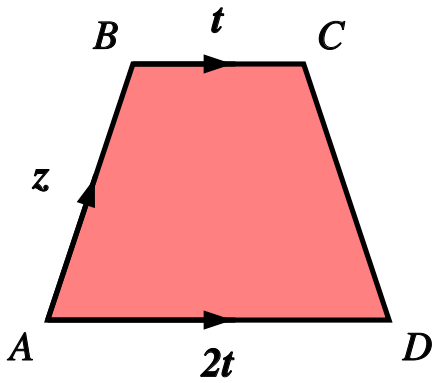
b) \vec{AC}

c) \vec{CD}

d) \vec{BD}

[1]

4) ABCD is a trapezium where $\vec{AB} = \mathbf{z}$, $\vec{BC} = \mathbf{t}$ and $\vec{AD} = 2\vec{BC}$.

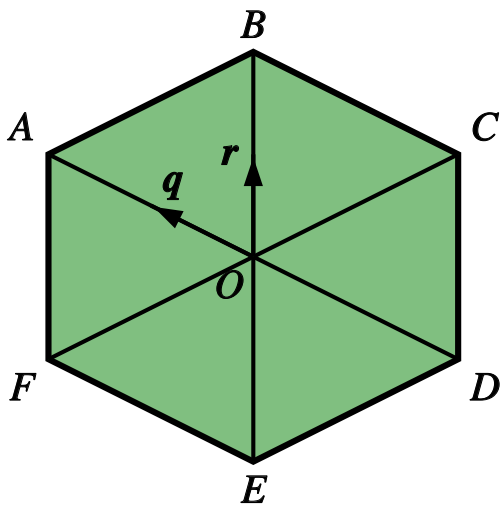


Express the following vectors in terms of \mathbf{t} and \mathbf{z} .

- a) \vec{AC} b) \vec{DB} c) \vec{CD} d) \vec{DC}

[1]

5) ABCDEF is a regular hexagon where $\vec{OA} = \mathbf{q}$ and $\vec{OB} = \mathbf{r}$.

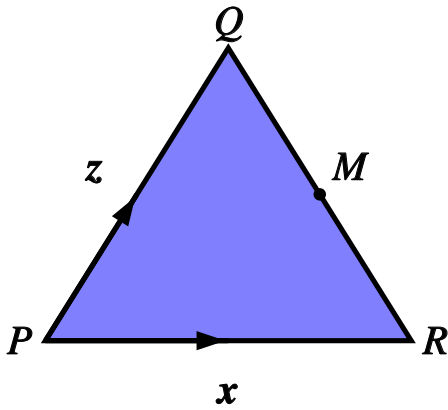


Express the following vectors in terms of \mathbf{q} and \mathbf{r} .

- a) \vec{AB} b) \vec{DB} c) \vec{OC} d) \vec{FD}

[1]

6) Triangle PQR is shown below where $\vec{PQ} = \mathbf{z}$, $\vec{PR} = \mathbf{x}$
M is the mid-point of QR.



Express the following vectors in terms of \mathbf{z} and \mathbf{x} .

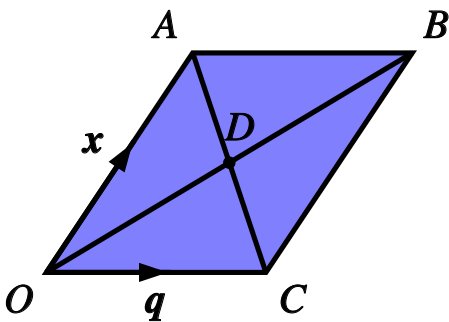
a) \vec{QR}

b) \vec{QM}

c) \vec{PM}

[1]

7) OABC is a parallelogram where $\vec{OA} = \mathbf{x}$ and $\vec{OC} = \mathbf{q}$.



Express the following vectors in terms of \mathbf{x} and \mathbf{q} .

a) \vec{OC}

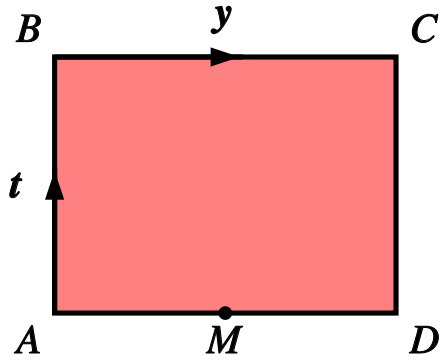
b) \vec{AC}

c) \vec{BO}

d) \vec{AD}

[1]

8) ABCD is a rectangle where $\vec{AB} = \mathbf{t}$, $\vec{BC} = \mathbf{y}$ and M is the mid-point of AD.



Express the following vectors in terms of \mathbf{t} and \mathbf{y} .

a) \vec{AM}

b) \vec{BM}

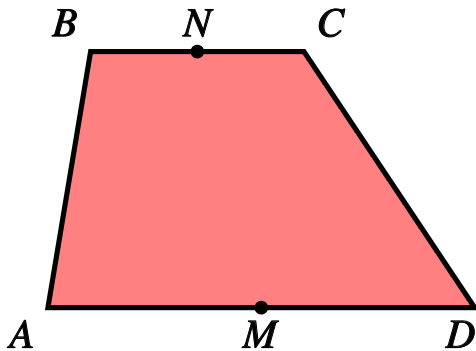
c) \vec{MC}

[1]

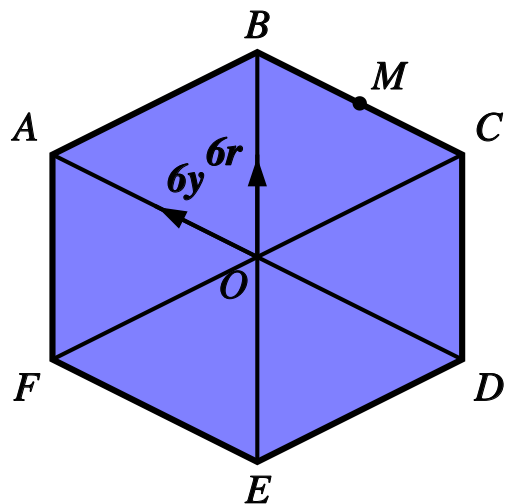
9) ABCD is a trapezium with BC parallel to AD.
M is the midpoint of AD and N is the midpoint of BC.

[1]

Given that $\vec{AB} = 2\mathbf{a}$, $\vec{BC} = 2\mathbf{z}$ and $\vec{AD} = 6\mathbf{z}$, express \vec{MN} in terms of \mathbf{z} and \mathbf{a} .



10) ABCDEF is a regular hexagon where $\vec{OA} = 6\mathbf{y}$, $\vec{OB} = 6\mathbf{r}$ and M is the midpoint of BC.



Express the following vectors in terms of \mathbf{y} and \mathbf{r} .

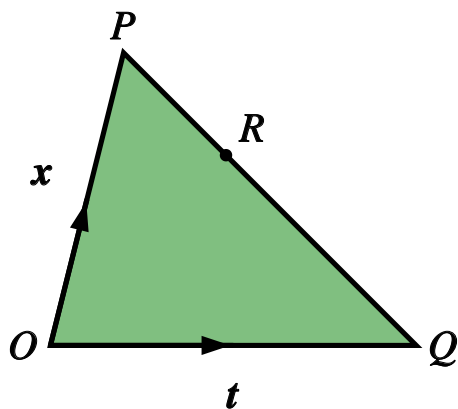
a) \vec{AB}

b) \vec{EF}

c) \vec{EM}

[1]

11) OPQ is a triangle where $\vec{OP} = \mathbf{x}$, $\vec{OQ} = \mathbf{t}$
R is the point on QR for which PR:RQ = 1:2.



Express the following vectors in terms of \mathbf{x} and \mathbf{t} .

a) \vec{QP}

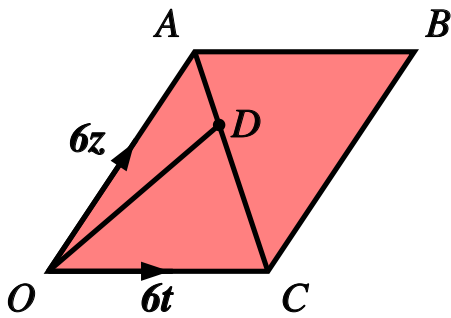
b) \vec{OR}

[1]

12) OABC is a parallelogram where $\vec{OA} = 6\mathbf{z}$ and $\vec{OC} = 6\mathbf{t}$.

[1]

D is the point on AC for which $AD = \frac{1}{3}AC$.

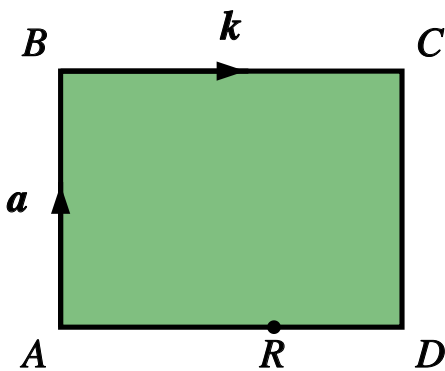


Express \vec{OD} in terms of \mathbf{z} and \mathbf{t} .

13) ABCD is a rectangle where $\vec{AB} = \mathbf{a}$, $\vec{BC} = \mathbf{k}$.

[1]

R is the point on AD for which $AR:AD = 2:3$.

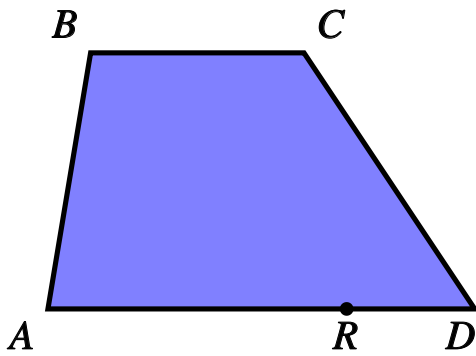


Express \vec{BR} in terms of \mathbf{a} and \mathbf{k} .

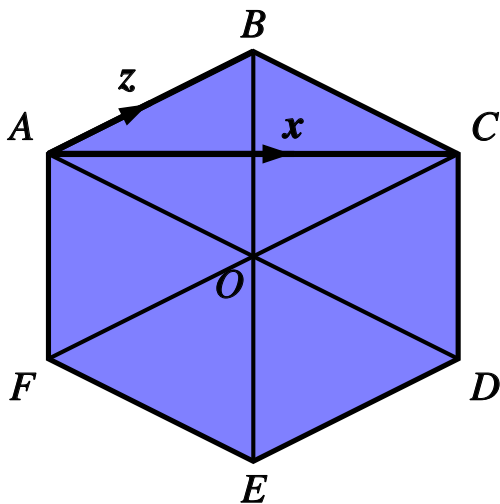
14) ABCD is a trapezium with BC parallel to AD and $AD = 2BC$.
R is the point on AD for which $AR:RD = 3:1$.

[1]

Given that $\vec{AB} = \mathbf{t}$ and $\vec{BC} = \mathbf{x}$, express \vec{RC} in terms of \mathbf{t} and \mathbf{x} .



15) ABCDEF is a regular hexagon where $\vec{AB} = \mathbf{z}$ and $\vec{AC} = \mathbf{x}$.



Express the following vectors in terms of \mathbf{z} and \mathbf{x} .

a) \vec{BE}

b) \vec{CE}

[1]

Solutions for the assessment Vector Geometry

1) a) $\vec{PQ} = \mathbf{k}$

b) $\vec{RP} = -\mathbf{a}$

c) $\vec{QR} = -\mathbf{k} + \mathbf{a}$

d) $\vec{RQ} = \mathbf{k} - \mathbf{a}$

2) a) $\vec{AB} = w$

b) $\vec{BC} = -y$

c) $\vec{OB} = y + w$

d) $\vec{AC} = w - y$

3) a) $\vec{AD} = y$

b) $\vec{AC} = b + y$

c) $\vec{CD} = -b$

d) $\vec{BD} = y - b$

4) a) $\vec{AC} = z + t$

b) $\vec{DB} = z - 2t$

c) $\vec{CD} = t - z$

d) $\vec{DC} = z - t$

5) a) $\vec{AB} = r - q$

b) $\vec{DB} = q + r$

c) $\vec{OC} = r - q$

d) $\vec{FD} = r - 2q$

6) a) $\vec{QR} = x - z$

b) $\vec{QM} = \frac{x}{2} - \frac{z}{2}$

c) $\vec{PM} = \frac{x}{2} + \frac{z}{2}$

7) a) $\vec{OC} = q$

b) $\vec{AC} = q - x$

c) $\vec{BO} = -x - q$

d) $\vec{AD} = \frac{1}{2}q - \frac{1}{2}x$

8) a) $\vec{AM} = \frac{y}{2}$

b) $\vec{BM} = \frac{y}{2} - t$

c) $\vec{MC} = \frac{y}{2} + t$

9) $\vec{MN} = 2a - 2z$

10) a) $\vec{AB} = 6r - 6y$

b) $\vec{EF} = 6y$

c) $\vec{EM} = 12r - 3y$

11) a) $\vec{QP} = x - t$

b) $\vec{OR} = \frac{2x}{3} + \frac{t}{3}$

12) $\vec{OD} = 4z + 2t$

13) $\vec{BR} = \frac{2}{3}k - a$

14) $\vec{RC} = t - \frac{x}{2}$

15) a) $\vec{BE} = 2x - 4z$

b) $\vec{CE} = x - 3z$

