Vector Geometry of grids and 2D shapes
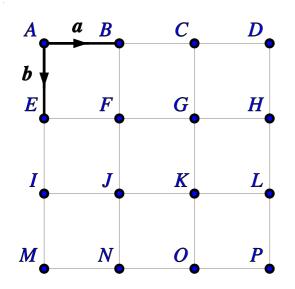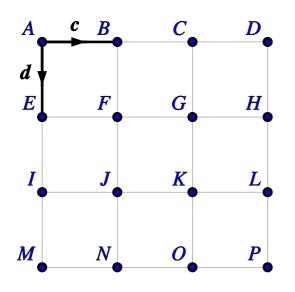
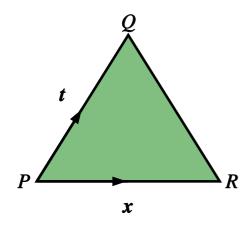Name: Class: Date:

1) Using the diagram below, express the vector $\overrightarrow{ML}$ in terms of **a** and **b**.   [1]

2) Find the vector formed when the vector **2d-3c** is added to point D. [1]
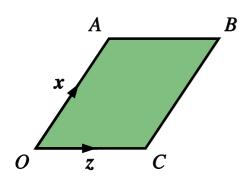Write the vector as capital letters e.g. $\vec{AB}$.

A c B   C   D

d

E   F   G   H

I   J   K   L

M   N   O   P

3) Triangle PQR is shown below where $\vec{PQ}$ = **t** and $\vec{PR}$ = **x**.

Q

t

P ——x—— R

Express the following vectors in terms of **t** and **x**.

a) $\vec{PQ}$ b) $\vec{RP}$ c) $\vec{QR}$ d) $\vec{RQ}$

[1]

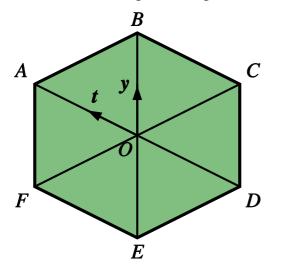**4)** OABC is a parallelogram where $\vec{OA} = \textbf{x}$ and $\vec{OC} = \textbf{z}$.

Express the following vectors in terms of **x** and **z**.

a) $\vec{AB}$ b) $\vec{BC}$ c) $\vec{OB}$ d) $\vec{AC}$

[1]

5) ABCDEF is a regular hexagon where $\vec{OA} = \textbf{t}$ and $\vec{OB} = \textbf{y}$.

Express the following vectors in terms of **t** and **y**.

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

[1]

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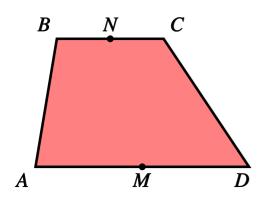

Express the following vectors in terms of **t** and **y**.
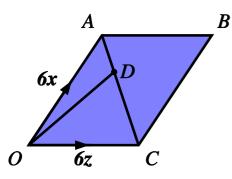
a) $\vec{AM}$ b) $\vec{BM}$ c) $\vec{MC}$

[1]

7) ABCD is a trapezium with BC parallel to AD.   [1]
M is the midpoint of AD and N is the midpoint of BC.

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

8) OABC is a parallelogram where $\vec{OA}$ = 6**x** and $\vec{OC}$ = 6**z**.   [1]

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

Express $\vec{OD}$ in terms of **x** and **z**.

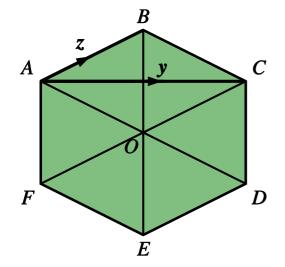**9)** ABCD is a trapezium with BC parallel to AD and AD = 2BC.   [1]
R is the point on AD for which AR:RD = 3:1.

Given that $\vec{AB}$ = **z** and $\vec{BC}$ = **k**, express $\vec{RC}$ in terms of **z** and **k**.

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

Express the following vectors in terms of **z** and **y**.

a) $\vec{BE}$

b) $\vec{CE}$

[1]

Solutions for the assessment Vector Geometry of grids and 2D shapes

1) $\vec{ML} = \textbf{3a-b}$

2) Vector $= \vec{DI}$

3) a) $\vec{PQ} = \textbf{t}$
b) $\vec{RP} = \textbf{-x}$
c) $\vec{QR} = \textbf{-t + x}$
d) $\vec{RQ} = \textbf{t-x}$

4) a) $\vec{AB} = z$
b) $\vec{BC} = -x$
c) $\vec{OB} = x + z$
d) $\vec{AC} = z - x$

5) a) $\vec{AB} = y - t$
b) $\vec{DB} = t + y$
c) $\vec{OC} = y - t$
d) $\vec{FD} = y - 2t$

6) a) $\vec{AM} = \frac{y}{2}$
b) $\vec{BM} = \frac{y}{2} - t$
c) $\vec{MC} = \frac{y}{2} + t$

7) $\vec{MN} = 2c - 2a$

8) $\vec{OD} = 4x + 2z$

9) $\vec{RC} = z - \frac{k}{2}$

10) a) $\vec{BE} = 2y - 4z$
b) $\vec{CE} = y - 3z$