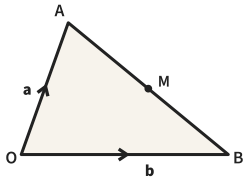


Vectors and ratio

1

$\vec{OA} = \mathbf{a}$ and $\vec{OB} = \mathbf{b}$. M is the midpoint of AB. Find $\vec{OM}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.



$$\vec{AB} = -\mathbf{a} + \mathbf{b}$$

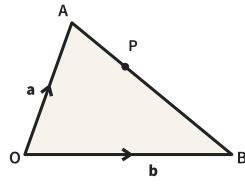
$$\vec{AM} = \frac{1}{2} \times \vec{AB} = -\frac{1}{2}\mathbf{a} + \frac{1}{2}\mathbf{b}$$

$$\vec{OM} = \mathbf{a} + \vec{AM} =$$

Answer _____

2

$\vec{OA} = \mathbf{a}$ and $\vec{OB} = \mathbf{b}$. P is on AB with AP : PB = 1 : 2. Find $\vec{OP}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.



$$\vec{AB} = -\mathbf{a} + \mathbf{b}$$

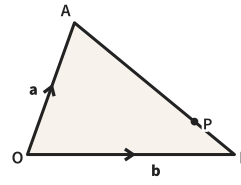
$$\vec{AP} = \frac{1}{3} \times \vec{AB} =$$

$$\vec{OP} = \mathbf{a} + \vec{AP} =$$

Answer _____

3

$\vec{OA} = \mathbf{a}$ and $\vec{OB} = \mathbf{b}$. P is on AB with AP : PB = 3 : 1. Find $\vec{OP}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.



$$\vec{AB} =$$

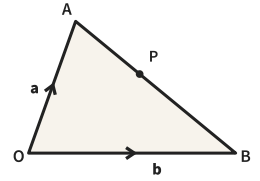
$$\vec{AP} = \frac{3}{4} \times \vec{AB} =$$

$$\vec{OP} = \mathbf{a} + \vec{AP} =$$

Answer _____

4

$\vec{OA} = \mathbf{a}$ and $\vec{OB} = \mathbf{b}$. P is on AB with AP : PB = 2 : 3. Find $\vec{OP}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.

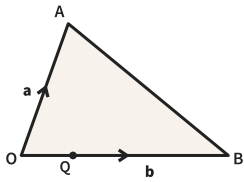


$$\vec{OP} = \mathbf{a} + \vec{AP} =$$

Answer _____

5

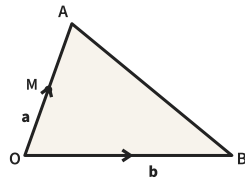
Q is on OB with OQ : QB = 1 : 3. Find $\vec{AQ}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.



Answer _____

6

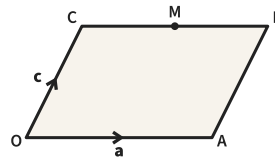
M is the midpoint of OA. Find $\vec{BM}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.



Answer _____

7

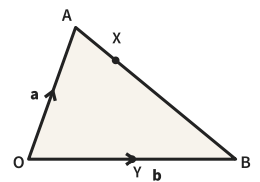
OABC is a parallelogram with $\vec{OA} = \mathbf{a}$ and $\vec{OC} = \mathbf{c}$. M is the midpoint of CB. Find $\vec{OM}$.



Answer _____

8

X is on AB with AX : XB = 1 : 3. Y is the midpoint of OB. Find $\vec{XY}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.

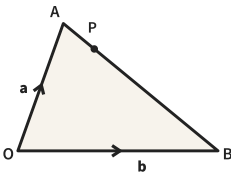


Answer _____

Vectors and ratio further practice

9

P is on AB with AP : PB = 1 : 4. Find $\vec{OP}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.



Answer _____

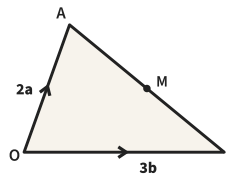
10

A is (1, 2) and B is (9, 6). P is on AB with AP : PB = 1 : 3. Find the coordinates of P.

Answer _____

11

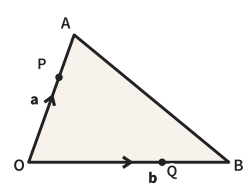
$\vec{OA} = 2\mathbf{a}$ and $\vec{OB} = 3\mathbf{b}$. M is the midpoint of AB. Find $\vec{OM}$.



Answer _____

12

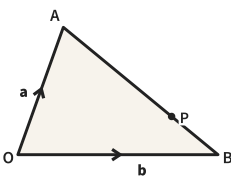
P is on OA with OP : PA = 2 : 1. Q is on OB with OQ : QB = 2 : 1. Show that PQ is parallel to AB.



Answer _____

13

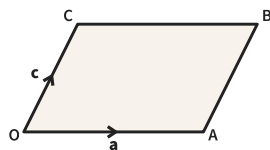
P is on AB and $\vec{OP} = 0.3\mathbf{a} + 0.7\mathbf{b}$. Find the ratio AP : PB.



Answer _____

14

OABC is a parallelogram with $\vec{OA} = \mathbf{a}$ and $\vec{OC} = \mathbf{c}$. Show that the midpoint of OB is also the midpoint of AC.



Answer _____

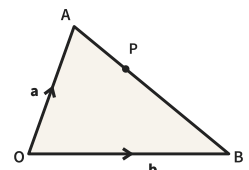
15

$\vec{OA} = \mathbf{a}$, $\vec{OB} = \mathbf{b}$ and $\vec{OC} = 3\mathbf{b} - 2\mathbf{a}$. Show that A, B and C lie on a straight line.

Answer _____

16

Leo says AP : PB = 1 : 2 means $\vec{AP} = \frac{1}{2}\vec{AB}$. Explain his mistake.



Answer _____