THIRD SPACE LEARNING

GCSE Exam Questions

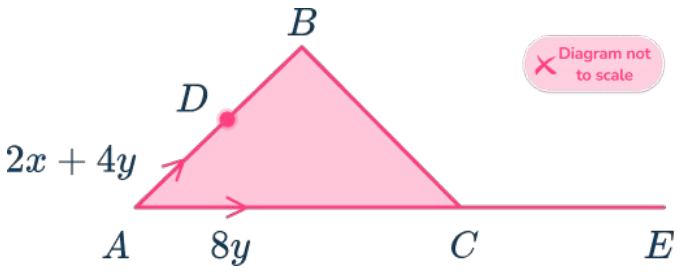
Vector Problems | Geometry & Measure

GCSE Exam Questions: Vector Problems

1) $\overrightarrow{AB} = 2x + 4y$, $\overrightarrow{AC} = 8y$.

D is the midpoint of AB.

The line AC is extended so that $\overrightarrow{AE} = 1.5\overrightarrow{AC}$



(a) Find the vector $\overrightarrow{BC}$.

(1)

(b) Find the vector $\overrightarrow{DE}$.

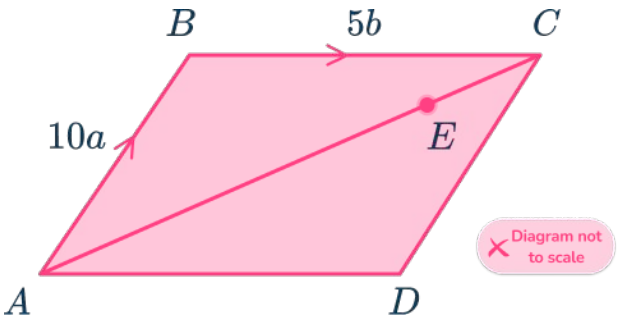
(2)

(3 marks)

GCSE Exam Questions: Vector Problems

2) $\overrightarrow{AB} = 10a$, $\overrightarrow{BC} = 5b$.

The point E lies on the line AC such that $AE{:}EC = 3{:}2$.



(a) Find the vector $\overrightarrow{AC}$.

(1)

(b) Show that $\overrightarrow{AE} = k(2a + b)$ and hence determine the value of k.

(2)

(3 marks)

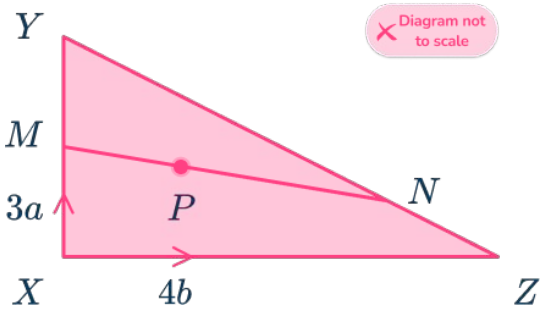
GCSE Exam Questions: Vector Problems

3) $\overrightarrow{XY} = 3a$, $\overrightarrow{XZ} = 4b$

$\overrightarrow{MY} = \frac{1}{3}\overrightarrow{XY}$

ZN:NY=1:3

P is the midpoint of $\overrightarrow{MN}$.



(a) Find the vector $\overrightarrow{MN}$.

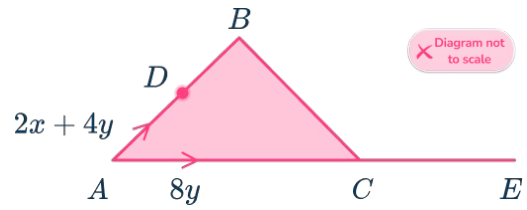
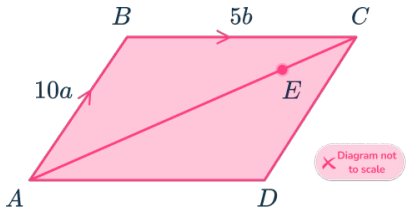
(3)

(b) Find the vector $\overrightarrow{XP}$.

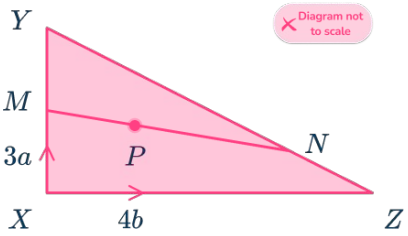
(3)

(6 marks)

GCSE Exam Questions: Vector Problems Answers

	Question	Answer	Marks
1)	$\overrightarrow{AB} = 2x + 4y$, $\overrightarrow{AC} = 8y$. D is the midpoint of AB. The line AC is extended so that $\overrightarrow{AE} = 1.5\overrightarrow{AC}$.  		
(a)	Find the vector $\overrightarrow{BC}$.	**(a)** $\overrightarrow{BC} = -2x - 4y + 8y = -2x + 4y$	**(1)**
(b)	Find the vector $\overrightarrow{DE}$.	**(b)** $\overrightarrow{AE} = 12y$, $\overrightarrow{DA} = -x - 2y$ $\overrightarrow{DE} = -x - 2y + 12y = -x + 10y$	**(1)** **(1)**
2)	$\overrightarrow{AB} = 10a$, $\overrightarrow{BC} = 5b$. The point E lies on the line AC such that $AE{:}EC = 3{:}2$.  		
(a)	Find the vector $\overrightarrow{AC}$.	**(a)** $\overrightarrow{AC} = 10a + 5b$	**(1)**
(b)	Show that $\overrightarrow{AE} = k(2a + b)$ and hence determine the value of k.	**(b)** $\overrightarrow{AE} = \frac{3}{5}(10a + 5b)$ $= 6a + 3b = 3(2a + b)$ $k = 3$	**(1)** **(1)**

GCSE Exam Questions: Vector Problems Answers

	Question	Answer	Marks
3)	$\overrightarrow{XY} = 3a$, $\overrightarrow{XZ} = 4b$ $\overrightarrow{MY} = \frac{1}{3}\overrightarrow{XY}$ $ZN:NY = 1:3$ P is the midpoint of $\overrightarrow{MN}$.  		
(a)	Find the vector $\overrightarrow{MN}$.	**(a)** $\overrightarrow{MY} = \boldsymbol{a}$ $\overrightarrow{YN} = \frac{3}{4}(-3a + 4b) = -\frac{9}{4}a + 3b$ $\overrightarrow{MN} = a - \frac{9}{4}a + 3b = -\frac{5}{4}a + 3b$	**(1)** **(1)** **(1)**
(b)	Find the vector $\overrightarrow{XP}$.	**(b)** $\overrightarrow{XM} = 2a$ $\overrightarrow{MP} = -\frac{5}{8}a + \frac{3}{2}b$ $\overrightarrow{XP} = 2a - \frac{5}{8}a + \frac{3}{2}b = \frac{11}{8}a + \frac{3}{2}b$	**(1)** **(1)** **(1)**

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