

QQQ – Pure Year 2 – Chapter 12 – Vectors (Version 2)

Total Marks: 24

(24 = Platinum, 22 = Gold, 19 = Silver, 16 = Bronze)

1. Two points A and B lie in a horizontal plane and have coordinates $(-2, 7)$ and $(3, 19)$ respectively.

A particle moves in a straight line from A to B under the action of a constant resultant force of magnitude 6.5 N

Express the resultant force in vector form.

[3 marks]

(Total 3 marks)

AQA June 2022 Paper 1 Q13

2.

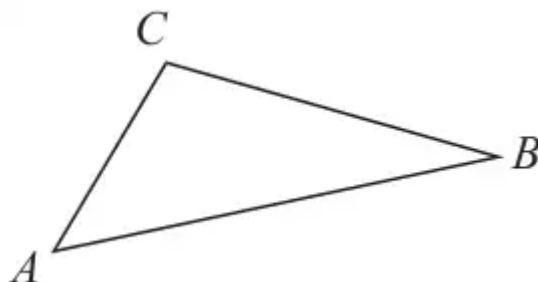


Figure 1

Figure 1 shows a sketch of triangle ABC .

Given that

- $\overrightarrow{AB} = -3\mathbf{i} - 4\mathbf{j} - 5\mathbf{k}$
- $\overrightarrow{BC} = \mathbf{i} + \mathbf{j} + 4\mathbf{k}$

(a) find $\overrightarrow{AC}$ **(2)**

(b) show that $\cos ABC = \frac{9}{10}$ **(3)**

(Total 5 marks)

Edexcel October 2021 Paper 1 Q6

3.

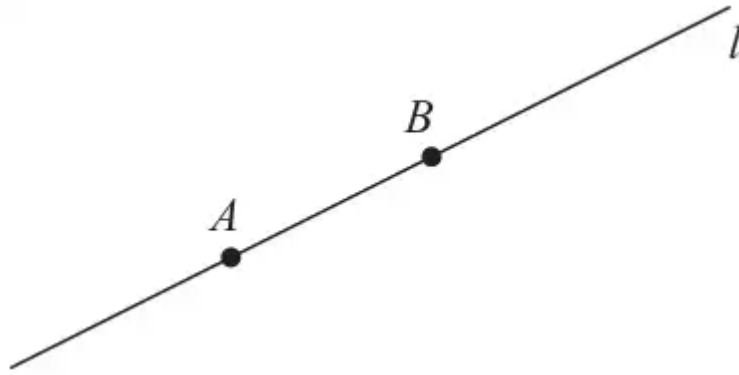


Figure 2

Figure 2 shows a sketch of the straight line l .

Line l passes through the points A and B .

Relative to a fixed origin O

- the point A has position vector $2\mathbf{i} - 3\mathbf{j} + 5\mathbf{k}$
- the point B has position vector $5\mathbf{i} + 6\mathbf{j} + 8\mathbf{k}$

(a) Find $\overrightarrow{AB}$ (1)

Given that a point P lies on l such that

$$|\overrightarrow{AP}| = 2|\overrightarrow{BP}|$$

(b) find the possible position vectors of P . (4)

(Total 5 marks)

4. [In this question, $\mathbf{i}$ and $\mathbf{j}$ are perpendicular unit vectors in a horizontal plane.]

A particle P is moving on a smooth horizontal surface under the action of two forces.

Given that

- the mass of P is 2 kg
- the two forces are $(2\mathbf{i} + 4\mathbf{j})$ N and $(c\mathbf{i} - 2\mathbf{j})$ N, where c is a constant
- the magnitude of the acceleration of P is $\sqrt{5} \text{ m s}^{-2}$

find the two possible values of c .

(5)

(Total 5 marks)

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5. The points A and B have position vectors $\begin{pmatrix} 1 \\ -2 \\ 5 \end{pmatrix}$ and $\begin{pmatrix} -3 \\ -1 \\ 2 \end{pmatrix}$ respectively.

(i) Find the exact length of AB .

[2]

(ii) Find the position vector of the midpoint of AB .

[1]

The points P and Q have position vectors $\begin{pmatrix} 1 \\ 2 \\ 0 \end{pmatrix}$ and $\begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$ respectively.

(iii) Show that $ABPQ$ is a parallelogram.

[3]

(Total 6 marks)

OCR A June 2018 Paper 2 Q2