Name: _____

IGCSE

Vectors (Magnitude)

Instructions

• Use **black** ink or ball-point pen.
• Answer all questions.
• Answer the questions in the spaces provided
– *there may be more space than you need.*
• Diagrams are **NOT** accurately drawn, unless otherwise indicated.
• You must **show all your working out.**

Information

• The marks for each question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

• Read each question carefully before you start to answer it.
• Keep an eye on the time.
• Try to answer every question.
• Check your answers if you have time at the end

June 2019 Paper 2H Question 14

1 Here are two vectors.

$$\overrightarrow{AB} = \begin{pmatrix} 6 \\ -9 \end{pmatrix} \qquad \overrightarrow{CB} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$$

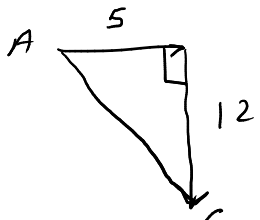
$$\overrightarrow{BC} = \begin{pmatrix} -1 \\ -3 \end{pmatrix}$$

Find the magnitude of $\overrightarrow{AC}$

$$\overrightarrow{AC} = \overrightarrow{AB} + \overrightarrow{BC}$$

$$= \begin{pmatrix} 6 \\ -9 \end{pmatrix} + \begin{pmatrix} -1 \\ -3 \end{pmatrix}$$

$$= \begin{pmatrix} 5 \\ -12 \end{pmatrix}$$



$$AC^2 = 5^2 + 12^2$$

$$= \sqrt{5^2 + 12^2}$$

13

(Total for Question 1 is 3 marks)

Sample Paper 2H Question 23

1 *ABCD* is a parallelogram

$$\overrightarrow{AB} = \begin{pmatrix} 2 \\ 3 \end{pmatrix} \qquad \overrightarrow{AC} = \begin{pmatrix} 9 \\ 4 \end{pmatrix}$$

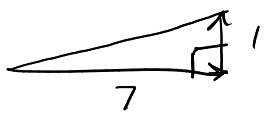
Find the magnitude of $\overrightarrow{BC}$

$$\overrightarrow{AB} + \overrightarrow{BC} = \overrightarrow{AC}$$

$$\overrightarrow{BC} = \overrightarrow{AC} - \overrightarrow{AB}$$

$$= \begin{pmatrix} 9 \\ 4 \end{pmatrix} - \begin{pmatrix} 2 \\ 3 \end{pmatrix}$$

$$= \begin{pmatrix} 7 \\ 1 \end{pmatrix}$$



$$BC^2 = 1^2 + 7^2$$

$$BC = \sqrt{1^2 + 7^2}$$

$$= 5\sqrt{2}$$

$5\sqrt{2}$

(Total for Question 1 is 3 marks)

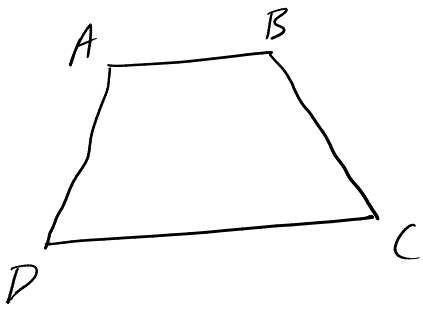
January 2019 Paper 2H Question 23

1 *ABCD* is a trapezium

$\overrightarrow{DC} = 3\overrightarrow{AB}$

$\overrightarrow{DA} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$ $\overrightarrow{DB} = \begin{pmatrix} -1 \\ 7 \end{pmatrix}$

$\overrightarrow{BD} = \begin{pmatrix} 1 \\ -7 \end{pmatrix}$



Find the exact magnitude of $\overrightarrow{BC}$

$\overrightarrow{DA} + \overrightarrow{AB} = \overrightarrow{DB}$

$\overrightarrow{AB} = \overrightarrow{DB} - \overrightarrow{DA}$

$= \begin{pmatrix} -1 \\ 7 \end{pmatrix} - \begin{pmatrix} -2 \\ 3 \end{pmatrix}$

$= \begin{pmatrix} 1 \\ 4 \end{pmatrix}$

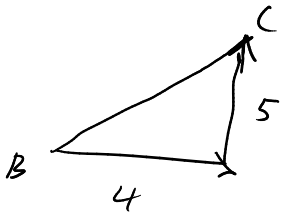
$\overrightarrow{DC} = 3\overrightarrow{AB} = 3\begin{pmatrix} 1 \\ 4 \end{pmatrix}$

$= \begin{pmatrix} 3 \\ 12 \end{pmatrix}$

$\overrightarrow{BC} = \overrightarrow{BD} + \overrightarrow{DC}$

$= \begin{pmatrix} 1 \\ -7 \end{pmatrix} + \begin{pmatrix} 3 \\ 12 \end{pmatrix}$

$= \begin{pmatrix} 4 \\ 5 \end{pmatrix}$



$BC^2 = 4^2 + 5^2$

$BC^2 = 41$

$BC = \sqrt{41}$

$\sqrt{41}$

(Total for Question 1 is 5 marks)