

Cambridge International AS & A Level

Mathematics

9709

Paper 1 Pure Mathematics 1

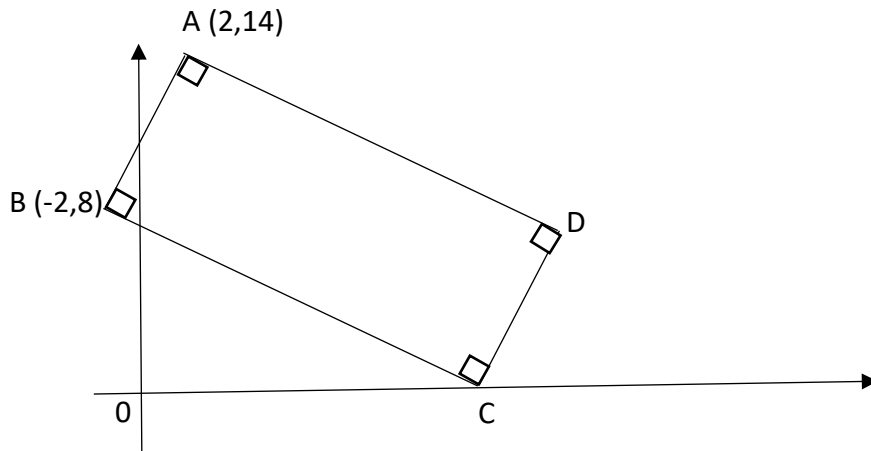
Topic 3-Coordinate Geometry

Question No (3)

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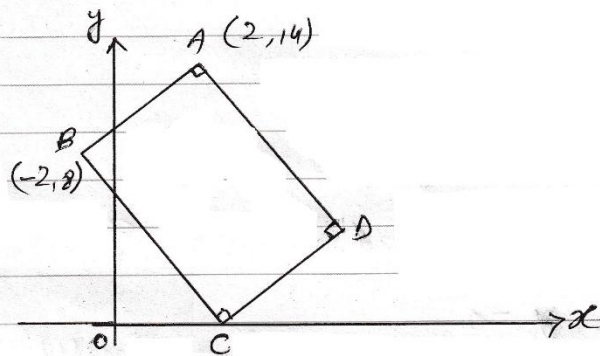
Question No (3)

The diagram shows a rectangle ABCD. The point A is (2,14), B is (-2,8) and C lies on the x-axis. Find

- (i) the equation of BC,
- (ii) the coordinates of C and D.

Solution

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$$\begin{aligned}
 \textcircled{1} \quad \text{Gradient of } AB &= \frac{8-14}{-2-2} \\
 &= \frac{-6}{-4} \\
 &= +\frac{3}{2}
 \end{aligned}$$

$$\text{gradient of } BC = -\frac{2}{3}$$

Equation of BC passing through

$B(-2, 8)$

$$y - y_1 = -\frac{2}{3}(x - x_1)$$

$$y - 8 = -\frac{2}{3}(x + 2)$$

$$3(y - 8) = -2(x + 2)$$

$$3y - 2u = -2x + 4$$

$$2x + 3y + 4 - 2u = 0$$

$$2x + 3y = 20$$

$$2x + 3y = 20 \rightarrow (1)$$

(ii)

As line BC cut the x-axis at C

$$\Rightarrow y = 0$$

put $y = 0$ in Equation (1)

$$2x + 3(0) = 20$$

$$x = \frac{20}{2}$$

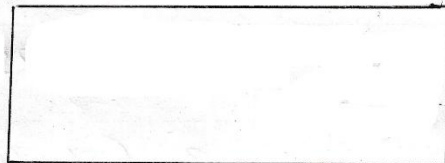
$$x = 10$$

$$\text{So } C(10, 0)$$

Property of Rectangle

$A(x_1, y_1)$

$B(x_2, y_2)$



$D(x_4, y_4)$

$C(x_3, y_3)$

$$x_1 + x_3 = x_2 + x_4$$

$$\text{and } y_1 + y_3 = y_2 + y_4$$

$$x - 2 = 2 + 10$$

$$x = 14$$

$$\text{and } y + 8 = 14 + 0$$

$$y = 14 - 8$$
$$= 6$$

$$\text{So } D(14, 6)$$