

SAMPLE PAPER 3: PAPER 2

QUESTION 3 (25 MARKS)

Question 3 (a) (i)

$$A(-1, -1), B(7, 3)$$

$$m_1 = \frac{3 - (-1)}{7 - (-1)} = \frac{4}{8} = \frac{1}{2}$$

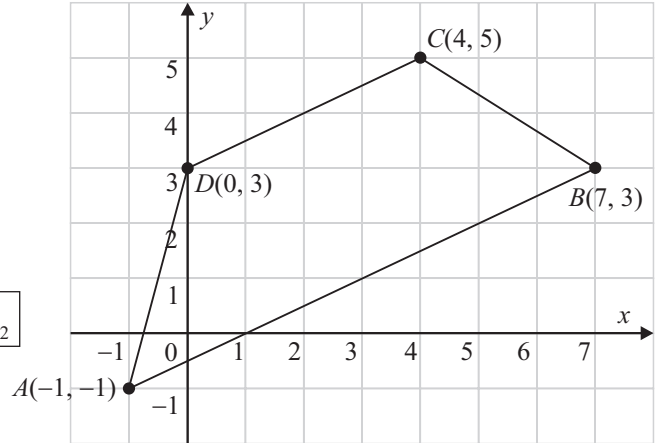
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$D(0, 3), C(4, 5)$$

$$m_2 = \frac{5 - 3}{4 - 0} = \frac{2}{4} = \frac{1}{2}$$

$$m_1 = m_2 \Rightarrow AB \parallel DC$$

$$\text{Parallel lines: } m_1 = m_2$$



Question 3 (a) (ii)

$$A(-1, -1), D(0, 3)$$

$$|AD| = \sqrt{(0 - (-1))^2 + (3 - (-1))^2} = \sqrt{1 + 16} = \sqrt{17}$$

$$|PQ| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$B(7, 3), C(4, 5)$$

$$|BC| = \sqrt{(4 - 7)^2 + (5 - 3)^2} = \sqrt{9 + 4} = \sqrt{13}$$

$$\therefore |AD| \neq |BC|$$

Question 3 (b)

Equation of line DB : $y = 3$

Equation of line AC :

Find slope of AC

$$A(-1, -1), C(4, 5)$$

$$m = \frac{5 - (-1)}{4 - (-1)} = \frac{6}{5}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y - 5 = \frac{6}{5}(x - 4)$$

$$y - y_1 = m(x - x_1)$$

$$5y - 25 = 6x - 24$$

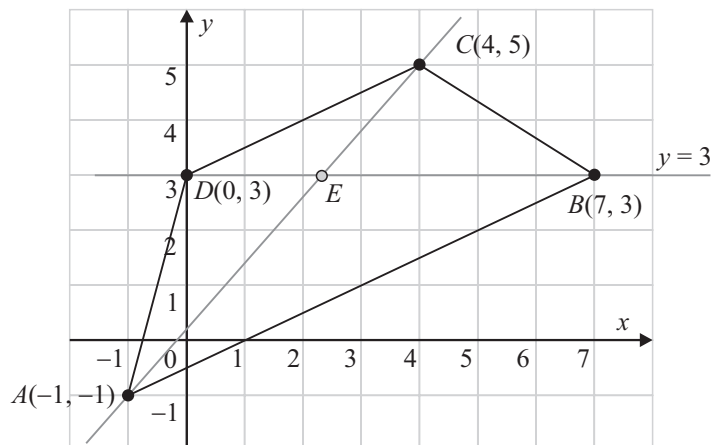
$$0 = 6x - 5y + 1$$

$$AC \cap DB: 6x - 5y + 1 = 0 \cap y = 3$$

$$6x - 5(3) + 1 = 0$$

$$6x = 14 \Rightarrow x = \frac{7}{3}$$

$$\therefore E\left(\frac{7}{3}, 3\right)$$



Question 3 (c)Midpoint of DB : $D(0, 3), B(7, 3)$

$$\text{Midpoint} = \left(\frac{0+7}{2}, \frac{3+3}{2} \right) = \left(\frac{7}{2}, 3 \right)$$

$$\text{Midpoint} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

Midpoint of AC : $A(-1, -1), C(4, 5)$

$$\text{Midpoint} = \left(\frac{-1+4}{2}, \frac{-1+5}{2} \right) = \left(\frac{3}{2}, 2 \right)$$

The midpoint of each diagonal is not equal to E , the point where the diagonals intersect.
Therefore, neither diagonal bisects the other.
