

Topical Revision Paper 9

Term 3 Unit 9: Points, Lines and Shapes

Question 1:

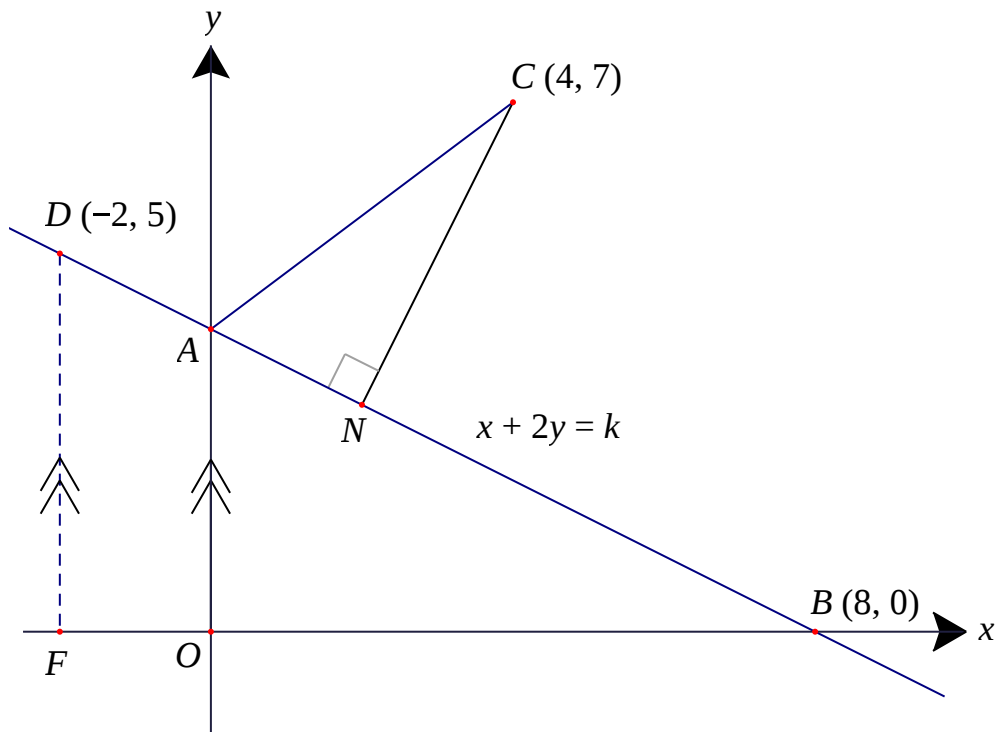
The vertices of a triangle ABC are $A(5, 10)$, $B(0, 0)$ and $C(-6, 8)$.

- (i) Show that the triangle ABC is an isosceles triangle. [2]
- (ii) Calculate the area of triangle ABC . [2]
- (iii) Find the coordinates of the foot of perpendicular from A to BC . [1]
- (iv) Given that four points A , B , C and D form a rhombus, find the coordinates of the point D . [3]
- (v) Find the equation of AC . Hence or otherwise, find the coordinates of the foot of perpendicular from B to AC . [5]

Answer: (ii) 50 units² (iii) $(3, -4)$ (iv) $(-11, -2)$ (v) $\left(-\frac{8}{5}, \frac{44}{5}\right)$

Question 2 :

The diagram below shows triangle ANC . Point B has coordinates $(8, 0)$, Point C has coordinates $(4, 7)$ and Point D has coordinates $(-2, 5)$. The equation of the straight line DB is $x + 2y = k$ and this line intersects the y -axis at A . Point N lies on the line DB such that CN is perpendicular to line DB . Point F is on the x -axis such that DF is parallel to the y -axis.



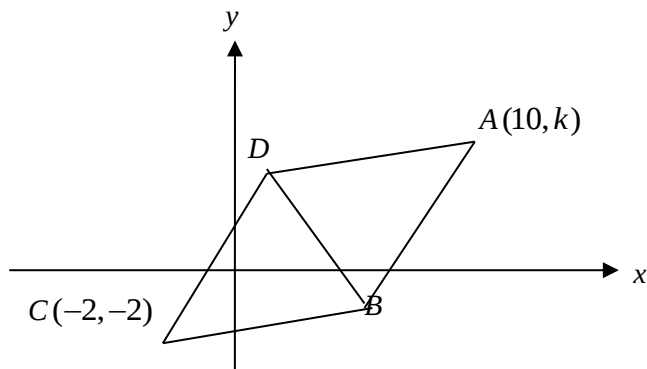
- (i) Find the value of k , in the equation of straight line DB . [2]
- (ii) Find
- (a) the gradient of CN , [2]
- (b) the equation of CN . [1]
- (iii) Calculate the coordinates of N . [2]
- (iv) Is CN a perpendicular bisector of BD ? Explain your answer. [1]
- (v) Calculate the area of triangle DFB . [3]
- (vi) Show clearly that the distance between D and B is 11.18 units, correct to 2 decimal places. [2]
- (vii) Find the perpendicular distance of F to BD . [2]

Answer:

- (i) 8 (ii) (a) Gradient of $CN = 2$ (b) $y = 2x - 1$ (iii) $N = (2, 3)$ (v) 25 units² (vii) 4.47

Question 3:

Solutions to this question by accurate drawing will not be accepted.



The diagram shows a rhombus $ABCD$ with vertices $A(10, k)$, B , $C(-2, -2)$ and D in which the equation of line BC is given to be $8y - x + 14 = 0$ and the equation of line BD is

$$2y + 3x - 16 = 0.$$

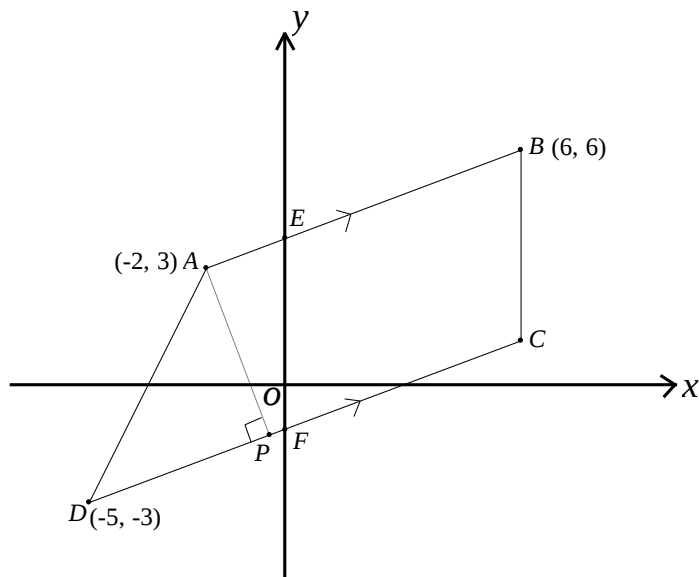
- (i) Show that $k = 6$. [3]
- (ii) Find the coordinates of B and of D . [6]
- (iii) Find the area of the rhombus $ABCD$. [2]

Answer:

(ii) $B: (6, -1)$ $D: (2, 5)$ (iii) 52 units²

Question 4:

Solutions to this question by accurate drawing will not be accepted.



The diagram shows a trapezium $ABCD$ in which AB is parallel to DC and BC is a vertical line. The vertices of the trapezium are $A(-2, 3)$, $B(6, 6)$, C and $D(-5, -3)$.

The perpendicular from A to DC meets DC at the point P .

(i) Find the coordinates of P and C . [6]

The lines AB and DC cut the y -axis at E and F respectively.

(ii) Find the area of the parallelogram $BCFE$. [2]

Answer:

(i) $P : \left(-\frac{29}{73}, -1\frac{20}{73}\right)$ $C : \left(6, 1\frac{1}{8}\right)$ (ii) 29.25 units^2