



Orienting Yourself: The Use of Coordinates

Lecture - 06

CLASS-9TH

MATHS

UDAY Sir

Physics Wallah



Topics To Be Covered

1

2

3

Questions



UDAY SIR

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WELCOME
BACK FIGHTERS

QUESTION



END-OF-CHAPTER EXERCISES

- What are the x-coordinate and y-coordinate of the point of intersection of the two axes?
- Point W has x-coordinate equal to -5 . Can you predict the coordinates of point H which is on the line through W parallel to the y-axis? Which quadrants can H lie in?
- Consider the points R (3, 0), A (0, -2), M (-5 , -2) and P (-5 , 2). If they are joined in the same order, predict:
 - Two sides of RAMP that are perpendicular to each other.
 - One side of RAMP that is parallel to one of the axes.
 - Two points that are mirror images of each other in one axis. Which axis will this be?

Now plot the points and verify your predictions.
- Plot point Z (5, -6) on the Cartesian plane. Construct a right-angled triangle IZN and find the lengths of the three sides.
(**Comment:** Answers may differ from person to person.)
- What would a system of coordinates be like if we did not have negative numbers? Would this system allow us to locate all the points on a 2-D plane?
- Are the points M (-3 , -4), A (0, 0) and G (6, 8) on the same straight line? Suggest a method to check this without plotting and joining the points.
- Use your method (from Problem 6) to check if the points R (-5 , -1), B (-2 , -5) and C (4, -12) are on the same straight line. Now plot both sets of points and check your answers.
- Using the origin as one vertex, plot the vertices of:
 - A right-angled isosceles triangle.
 - An isosceles triangle with one vertex in Quadrant III and the other in Quadrant IV.
- The following table shows the coordinates of points S, M and T. In each case, state whether M is the midpoint of segment ST. Justify your answer.

S	M	T	Is M the midpoint of ST? Yes or No	Reason for your answer
(-3 , 0)	(0, 0)	(3, 0)		
(2, 3)	(3, 4)	(4, 5)		
(0, 0)	(0, 5)	(0, -10)		
(-8 , 7)	(0, -2)	(6, -3)		

When M is the mid-point of ST, can you find any connection between the coordinates of M, S and T?

- Use the connection you found to find the coordinates of B given that M (-7 , 1) is the midpoint of A (3, -4) and B (x, y).
- Let P, Q be points of trisection of AB, with P closer to A, and Q closer to B. Using your knowledge of how to find the coordinates of the midpoint of a segment, how would you find the coordinates of P and Q? Do this for the case when the points are A (4, 7) and B (16, -2).
- Given the points A (1, -8), B (-4 , 7) and C (-7 , -4), show that they lie on a circle K whose center is the origin O (0, 0). What is the radius of circle K?
 - Given the points D (-5 , 6) and E (0, 9), check whether D and E lie within the circle, on the circle, or outside the circle K.
- The midpoints of the sides of triangle ABC are the points D, E, and F. Given that the coordinates of D, E, and F are (5, 1), (6, 5), and (0, 3), respectively, find the coordinates of A, B and C.
- A city has two main roads which cross each other at the centre of the city. These two roads are along the North-South (N-S) direction and East-West (E-W) direction. All the other streets of the city run parallel to these roads and are 200 m apart. There are 10 streets in each direction.
 - Using 1 cm = 200 m, draw a model of the city in your notebook. Represent the roads/streets by single lines.
 - There are street intersections in the model. Each street intersection is formed by two streets—one running in the N-S direction and another in the E-W direction. Each street

QUESTION



14 *Ganita Manjari | Grade 9 | Part I*

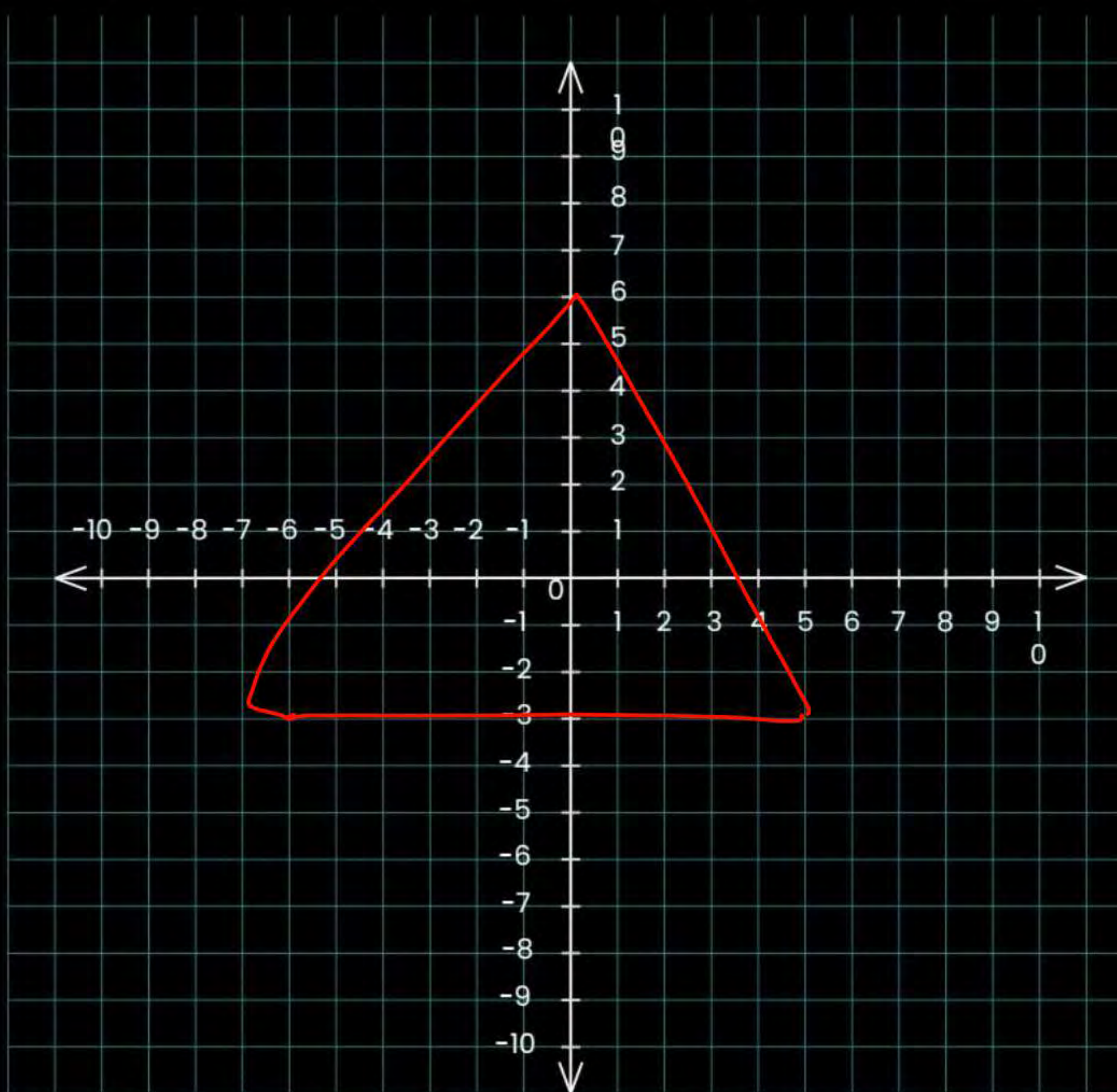
intersection is referred to in the following manner: If the second street running in the N-S direction and 5th street in the E-W direction meet at some crossing, then we call this street intersection (2, 5). Using this convention, find:

- (a) how many street intersections can be referred to as (4, 3).
 - (b) how many street intersections can be referred to as (3, 4).
15. A computer graphics program displays images on a rectangular screen whose coordinate system has the origin at the bottom-left corner. The screen is 800 pixels wide and 600 pixels high. A circular icon of radius 80 pixels is drawn with its centre at the point A (100, 150). Another circular icon of radius 100 pixels is drawn with its centre at the point B (250, 230). Determine:
- (i) whether any part of either circle lies outside the screen.
 - (ii) whether the two circles intersect each other.
16. Plot the points A (2, 1), B (-1, 2), C (-2, -1), and D (1, -2) in the coordinate plane. Is ABCD a square? Can you explain why? What is the area of this square?

QUESTION

Using the origin as one vertex, plot the vertices of:

- (i) A right-angled isosceles triangle.
- (ii) An isosceles triangle with one vertex in Quadrant III and the other in Quadrant IV.



$$[0,0] \Rightarrow [4,7]$$

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

$$\sqrt{(7-0)^2 + (4-0)^2}$$

$$\sqrt{49 + 16}$$

$$\sqrt{65}$$

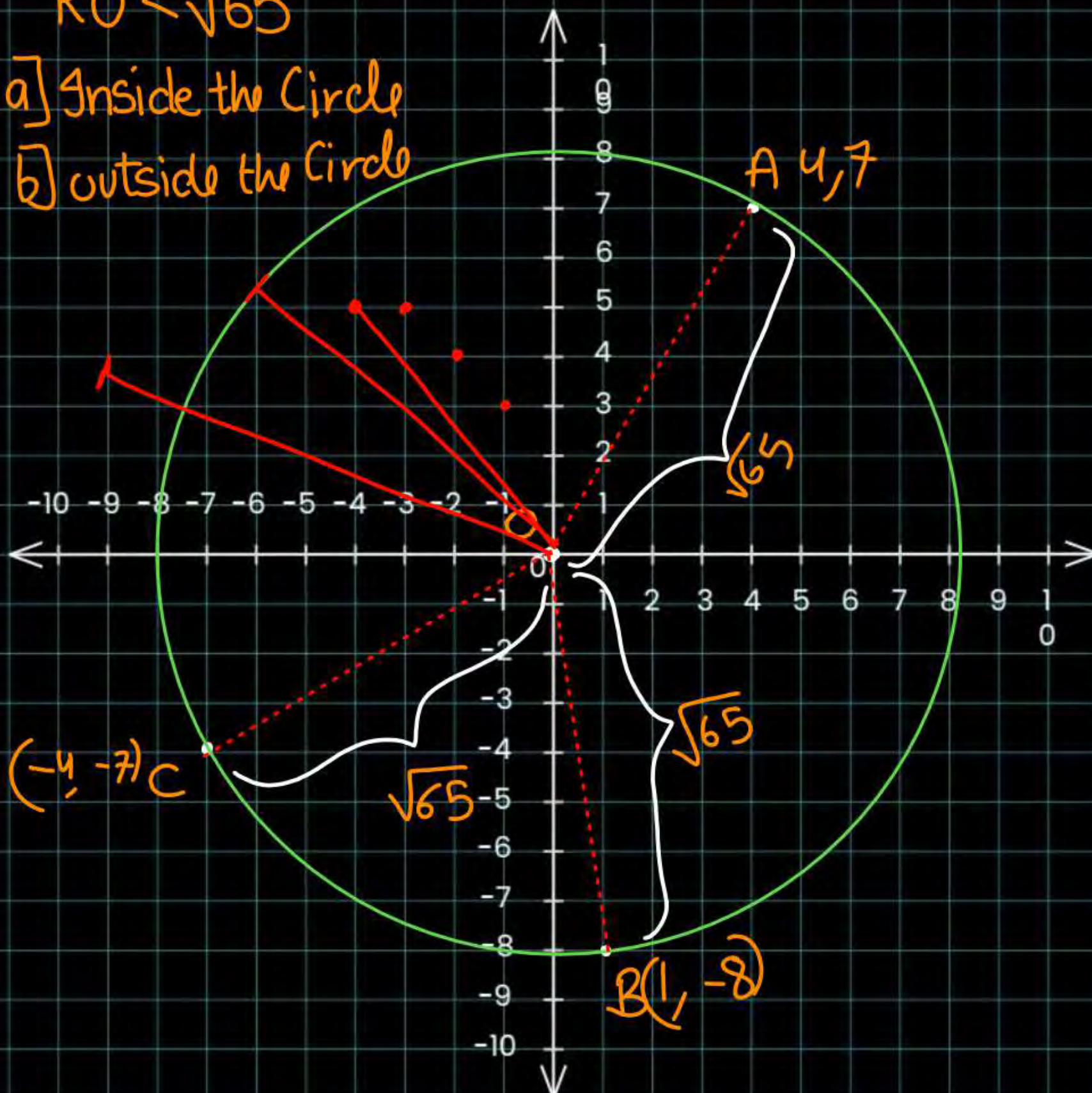
$$\frac{49}{16}$$

$$\frac{65}{65}$$

$$KO < \sqrt{65}$$

a) Inside the Circle

b) outside the Circle



$$(0,0) \leftrightarrow (-4,-7)$$



$$\sqrt{(-7-0)^2 + (-4-0)^2}$$

$$\sqrt{-7^2 + (-4)^2}$$

$$\sqrt{49 + 16}$$

$$\sqrt{65}$$

QUESTION

A city has two main roads which cross each other at the center of the city. These two roads are along the North-South (N-S) direction and East-West (E-W) direction. All the other streets of the city run parallel to these roads and are 200 m apart. There are 10 streets in each direction.

- (i) Using 1 cm = 200 m, draw a model of the city in your notebook. Represent the roads/streets by single lines.

$1\text{cm} = 200\text{m}$
Scale

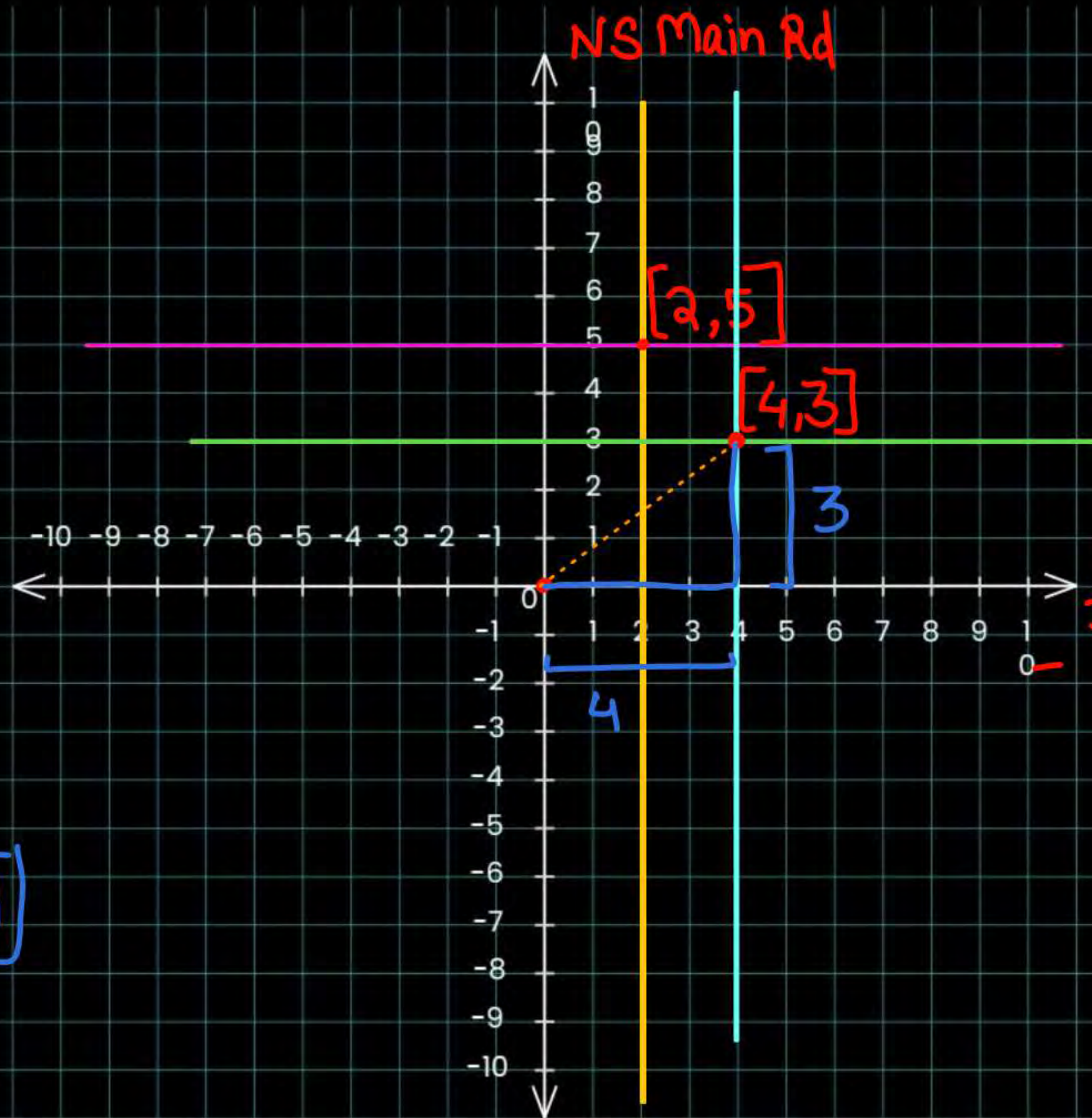
$$H^2 = P^2 + B^2$$

$$H^2 = 3^2 + 4^2$$

$$H^2 = 9 + 16$$

$$H = \sqrt{25} = 5\text{cm}$$

$$5 \times 200 = 1000\text{m}$$



Q] find the dis.
of (4, 3) int.
from M.R. Int.

WE Main Rd
x

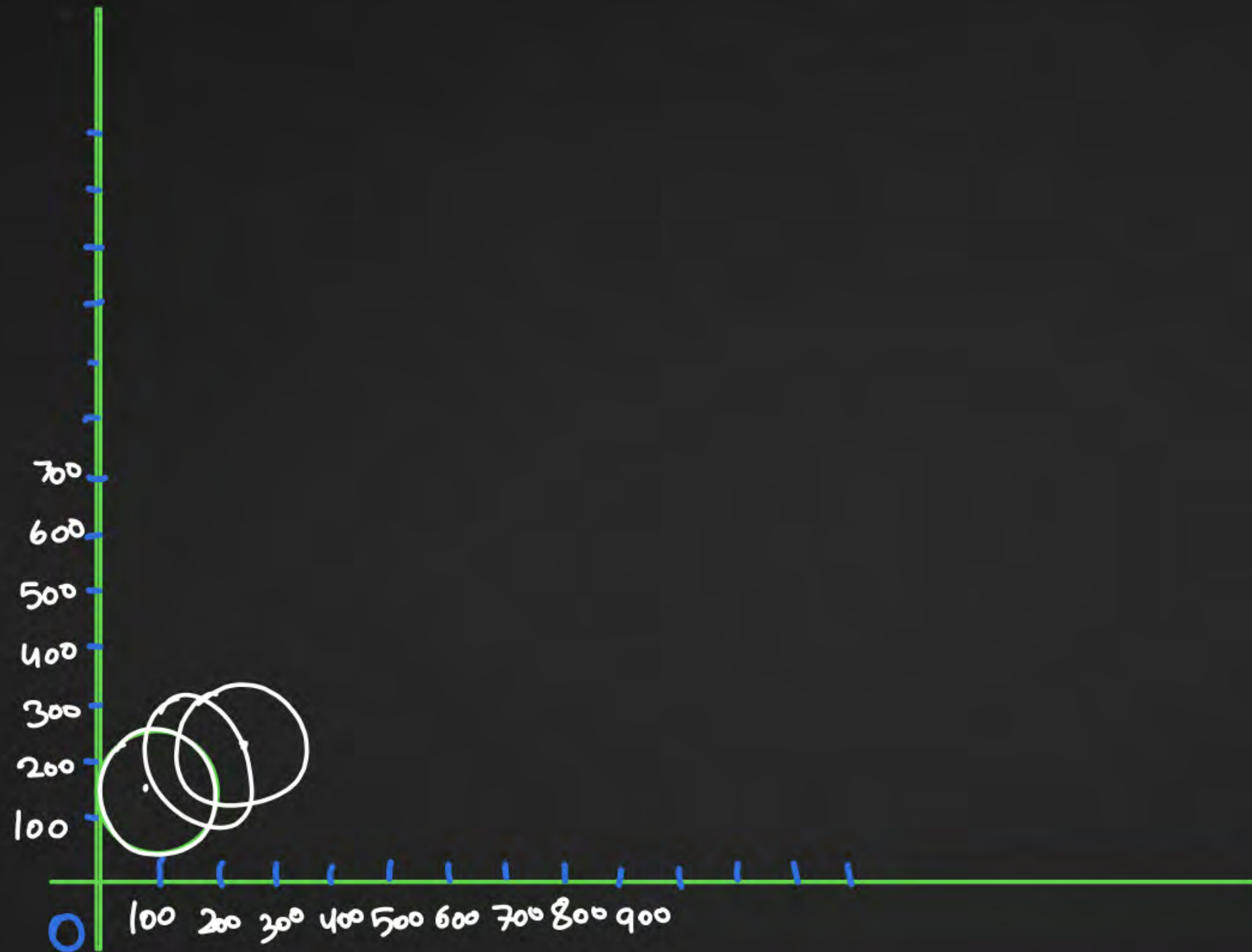
(ii) There are street intersections in the model. Each street intersection is formed by two streets—one running in the N-S direction and another in the E-W direction. Each street intersection is referred to in the following manner: If the second street running in the N-S direction and 5th street in the E-W direction meet at some crossing, then we call this street intersection $(2, 5)$. Using this convention, find:

- (a) How many street intersections can be referred to as $(4, 3)$.
- (b) How many street intersections can be referred to as $(3, 4)$.

QUESTION

A computer graphics program displays images on a rectangular screen whose coordinate system has the origin at the bottom-left corner. The screen is 800 pixels wide and 600 pixels high. A circular icon of radius 80 pixels is drawn with its centre at the point A (100, 150). Another circular icon of radius 100 pixels is drawn with its centre at the point B (250, 230). Determine:

- (i) Whether any part of either circle lies outside the screen. No
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-



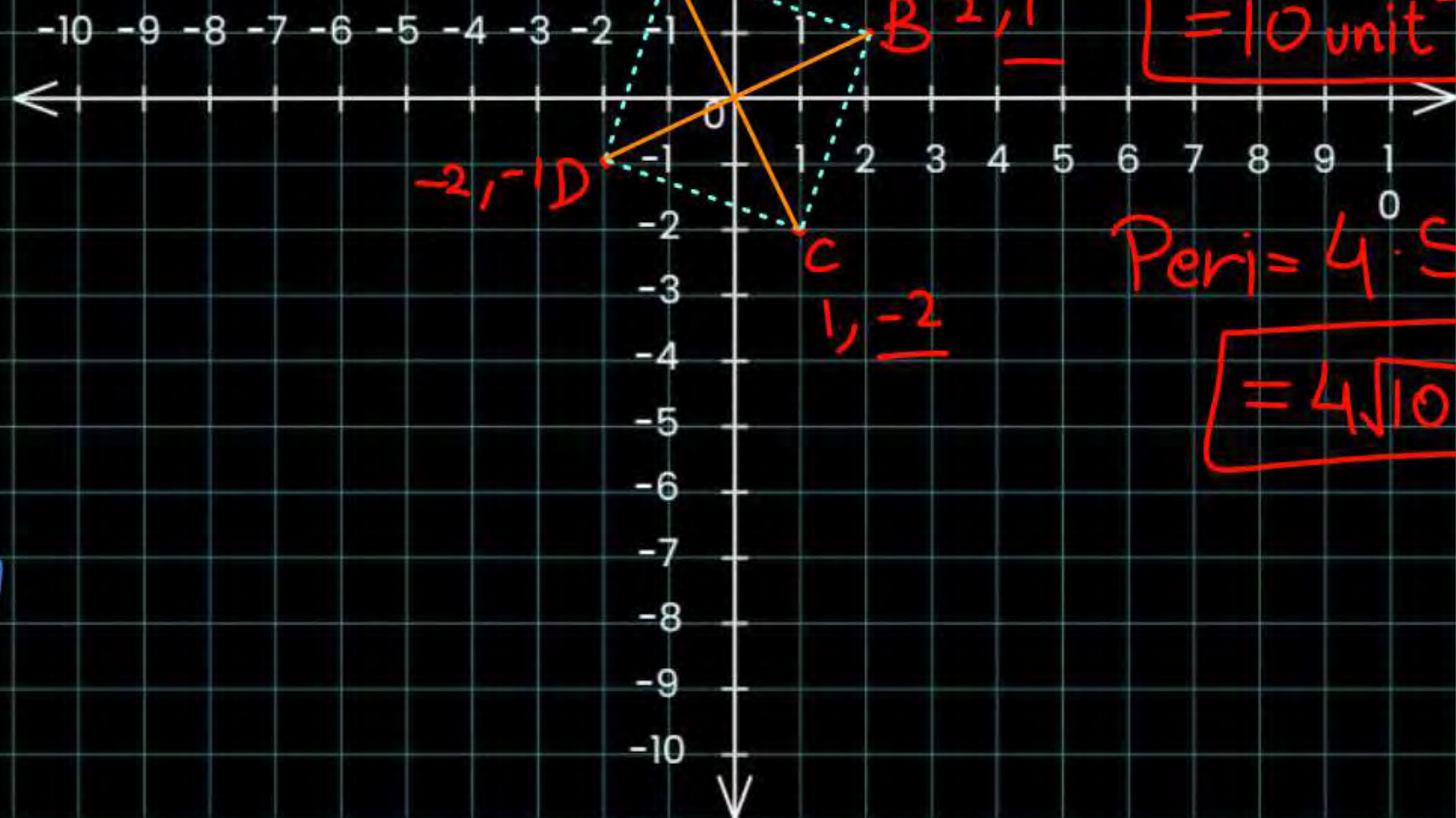
QUESTION

Plot the points A (2, 1), B (-1, 2), C (-2, -1), and D (1, -2) in the coordinate plane. Is ABCD a square? Can you explain why? What is the area of this square?

AB

$$\sqrt{[1-2]^2 + [2-(-1)]^2}$$

$$\sqrt{1^2 + 9}$$

 $\sqrt{10}$ unit


$$AB = BC = CD = DA \checkmark$$

$$AC = BD \checkmark$$

$$\text{Area} = [\text{Side}]^2$$

$$= \sqrt{10}^2$$

$$= 10 \text{ unit}^2$$

$$\text{Peri} = 4 \cdot S$$

$$= 4\sqrt{10} \text{ unit}$$

BC

$$\sqrt{[-2-1]^2 + [1-2]^2}$$

$$\sqrt{-3^2 + (-1)^2}$$

$$\sqrt{9+1}$$

$$\sqrt{10}$$



Section formula in
School

a) yes

b) No

QUESTION

Find the point on y-axis equidistant from $(2, -3)$ and $(-2, 5)$.

QUESTION

Choose the correct alternative answer for the following question. What is the form of co - ordinate of a point on the X - axis?

A (b, b)

B $(0, b)$

C $(a, 0)$

D (a, a)

QUESTION

If the coordinates of the two points are $P(-2, 3)$ and $Q(-3, 5)$, then
(Abscissa of P) – (Abscissa of Q) is

A -5

B 1

C -1

D -2

QUESTION

$A(-6, 3)$ and $B(6, -1)$. Find the points of trisection of AB .

HW

- DPPs ALL
- EOE NCERT
- Notes Revise

Thank,
you!