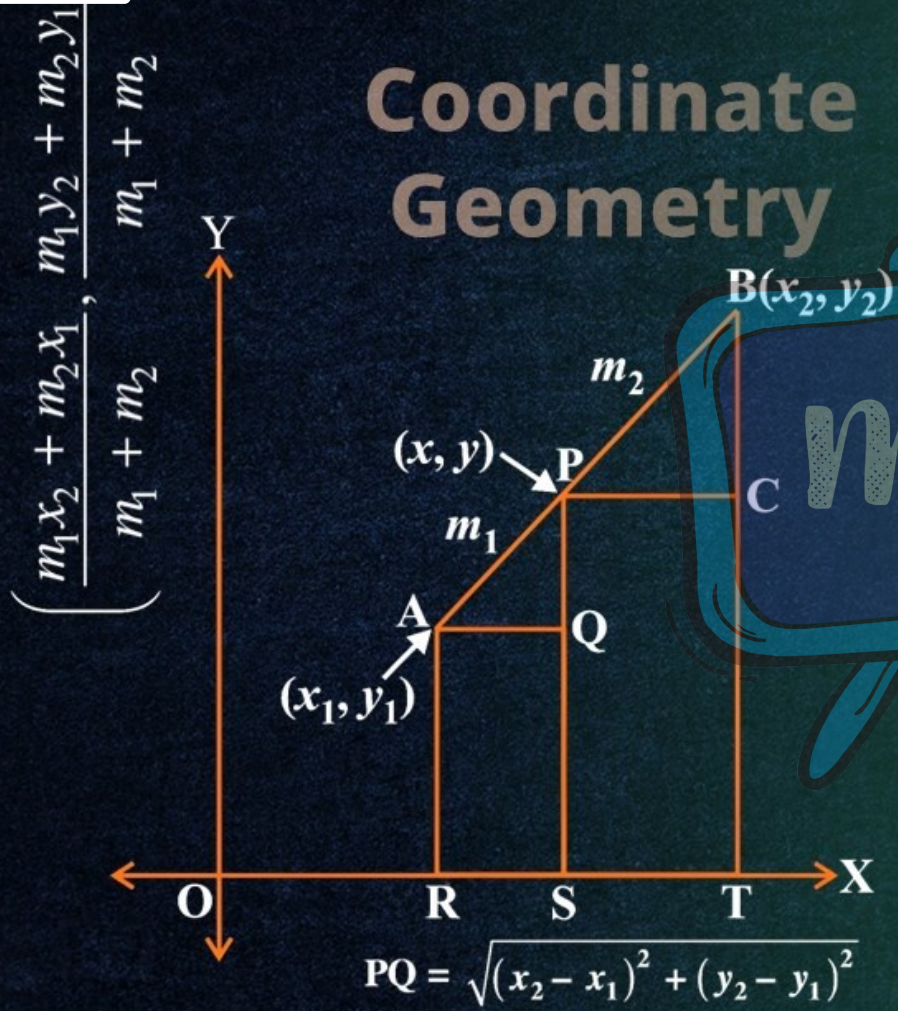


Coordinate Geometry



CLASS - 10

MATHEMATICS

Chapter - 7

Coordinate Geometry

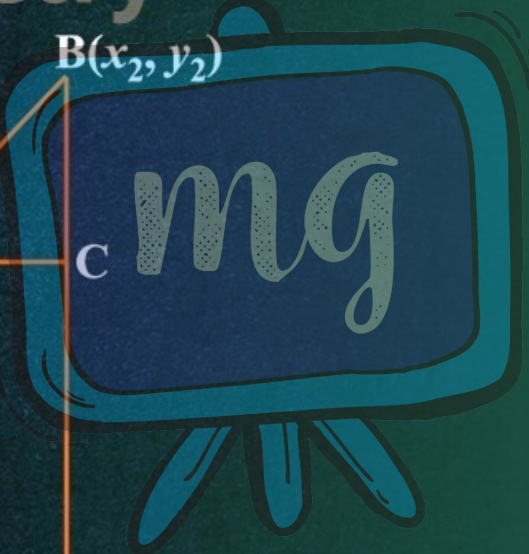
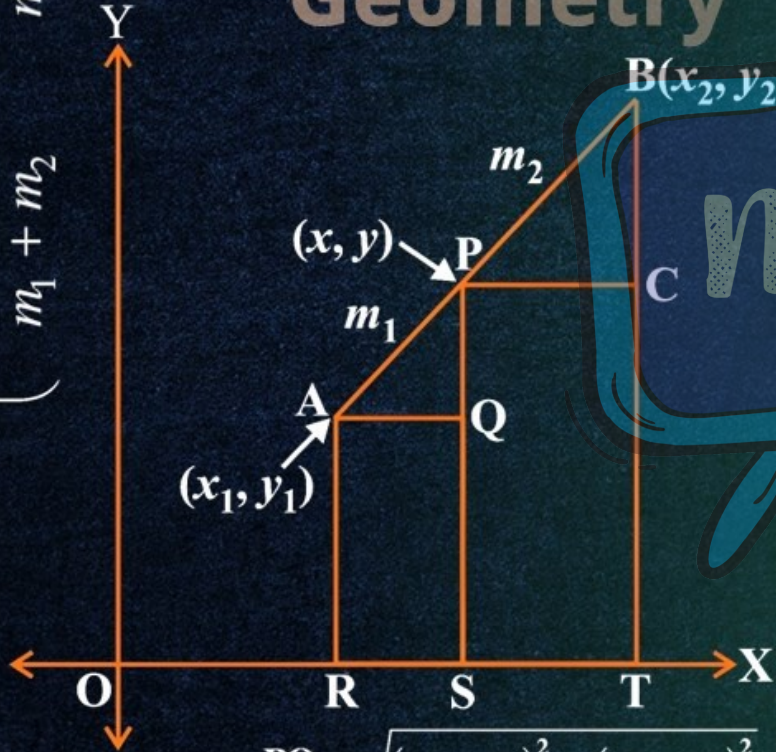
Part - 7

Exercise 7.2 (Q.6-10)

Shubham Tiwari

Coordinate Geometry

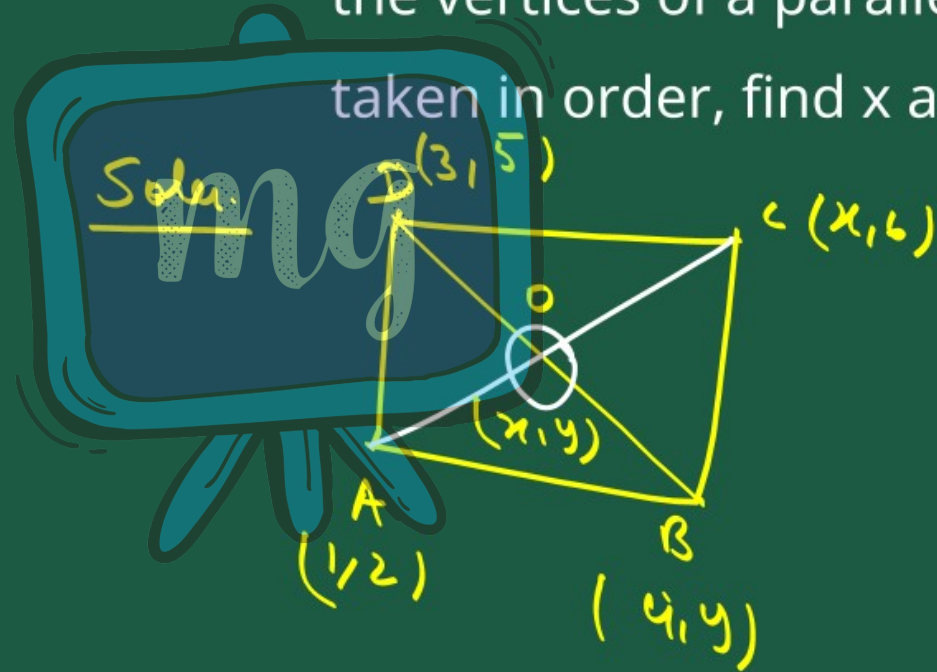
$$\left(\frac{m_1x_2 + m_2x_1}{m_1 + m_2}, \frac{m_1y_2 + m_2y_1}{m_1 + m_2} \right)$$



EXERCISE 7.2

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

6. If $(1, 2)$, $(4, y)$, $(x, 6)$ and $(3, 5)$ are the vertices of a parallelogram taken in order, find x and y .



By mid-point formula.

(x, y)

A B C

$(1, 2)$ $(x, 6)$

$x = \frac{x_1 + x_2}{2}$, $y = \frac{y_1 + y_2}{2}$

$x = \frac{x+1}{2}$ $y = \frac{6+2}{2}$

B (x, y) D

$(4, 9)$ $(3, 5)$

$x = \frac{4+3}{2}$, $y = \frac{9+5}{2}$

by comparing the co-ordinates

$$\begin{aligned}x+1 &= 4+3 \\x+1 &= 4+3 \\x &= 4+3-1 \\x &= 6\end{aligned}$$

$$6+2 = y+5$$

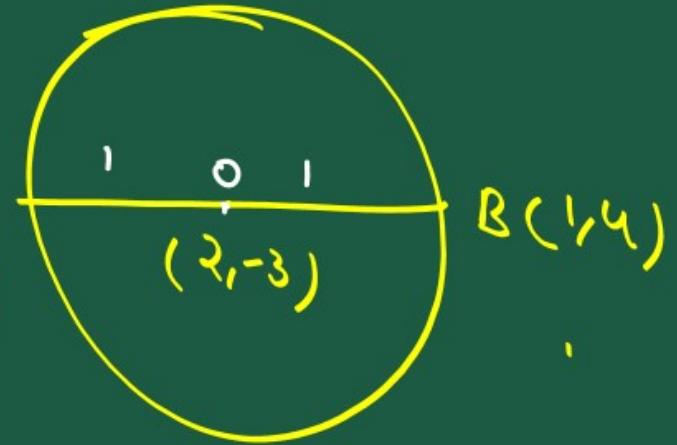
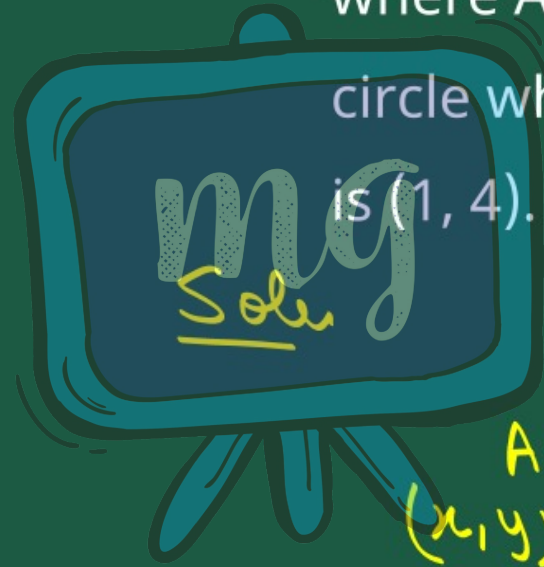
$$6+2 = y+5$$

$$6+2-5 = y$$

$$3 = y$$

Hence the value for x and y are 6, 3.

7. Find the coordinates of a point A, where AB is the diameter of a circle whose centre is $(2, -3)$ and B is $(1, 4)$.



By mid-point formula.

$$x = \frac{x_1 + x_2}{2}$$
$$2 = \frac{x + 1}{2}$$
$$2 \times 2 = x + 1$$
$$4 = x + 1$$
$$3 = x$$

$$y = \frac{y_1 + y_2}{2}$$

$$-3 = \frac{y + 4}{2}$$

$$-6 = y + 4$$

$$-6 - 4 = y$$

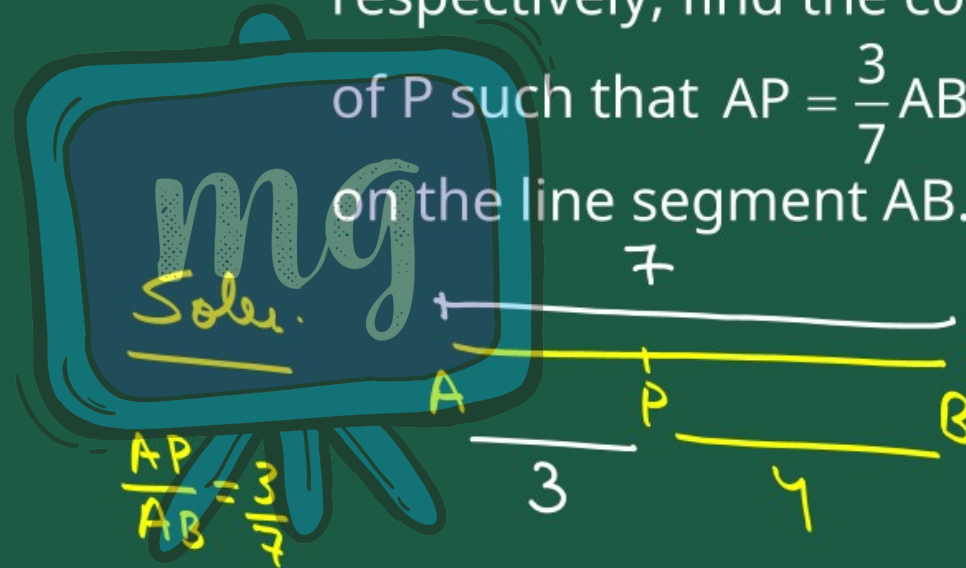
$$-10 = y$$

Hence the coordinates for A

is $(3, -10)$

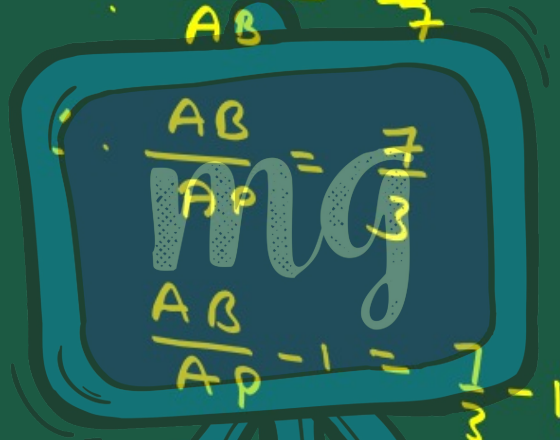


8. If A and B are $(-2, -2)$ and $(2, -4)$, respectively, find the coordinates of P such that $AP = \frac{3}{7}AB$ and P lies on the line segment AB.



$$AP = \frac{3}{7} AB$$

$$\therefore \frac{AP}{AB} = \frac{3}{7}$$



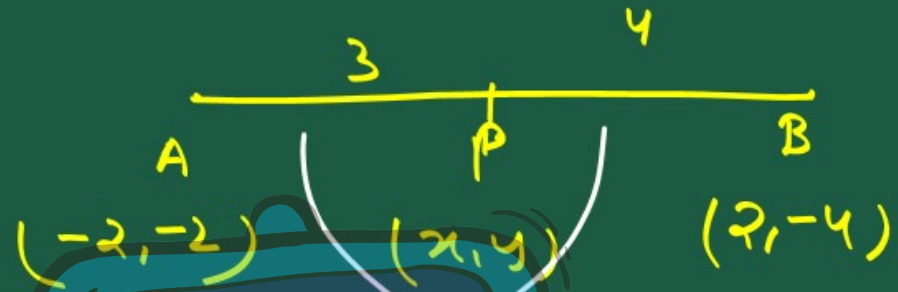
$$\frac{AB}{AP} - 1 = \frac{7}{3} - 1$$

$$\frac{AB - AP}{AP} = \frac{7 - 3}{3}$$

$$\frac{PB}{AP} = \frac{4}{3}$$

} by Subtracting 1
both side }

$$AP : PB = 3 : 4$$



By section formula

$$x = \frac{m_2 x_1 + m_1 x_2}{m_1 + m_2}$$

$$x = \frac{3 \times 2 + 4 \times -2}{3 + 4}$$

$$x = \frac{6 - 8}{7} = -\frac{2}{7}$$

$$y = \frac{m_2 y_1 + m_1 y_2}{m_1 + m_2}$$

$$y = \frac{3 \times -4 + 4 \times -2}{3 + 4}$$

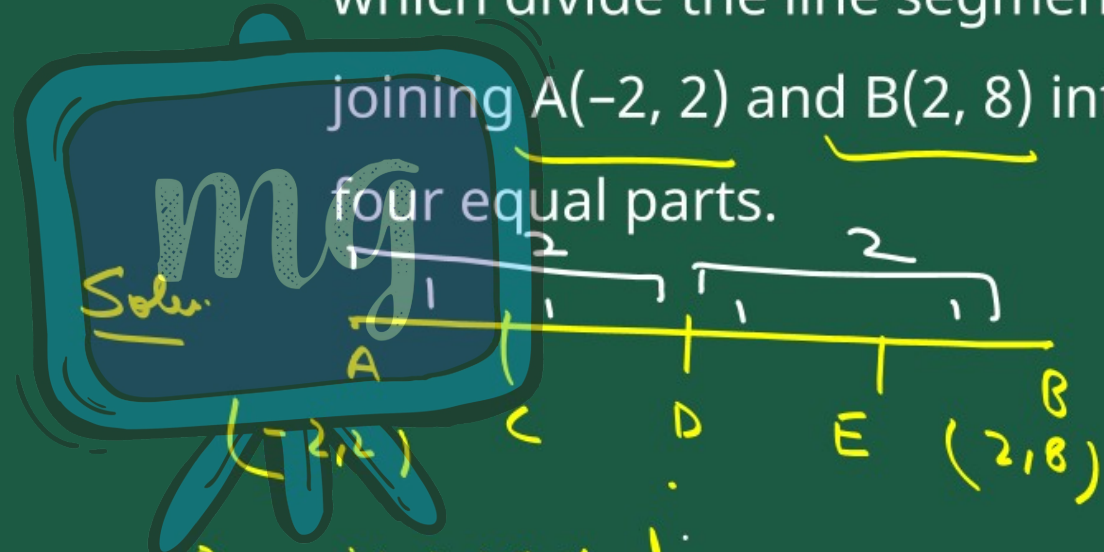
$$y = \frac{-12 - 8}{7} = -\frac{20}{7}$$

So the coordinates of P

$$\text{is } \left(-\frac{2}{7}, -\frac{20}{7}\right)$$



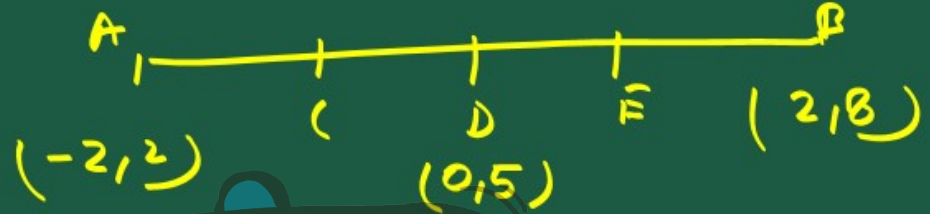
9. Find the coordinates of the points which divide the line segment joining $A(-2, 2)$ and $B(2, 8)$ into four equal parts.



Soln.

By mid point formula: -

$$x = \frac{x_1 + x_2}{2} \quad \left| \quad y = \frac{y_1 + y_2}{2} \right|$$



mid point of AB.

$x = \frac{-2 + 2}{2}$

$x = \frac{0}{2} = 0$

$y = \frac{2 + 8}{2}$

$y = \frac{10}{2} = 5$

The ordinate of D (0, 5)

mid point of AD

$$x = \frac{-2+0}{2}, y = \frac{2+5}{2}$$

$$x = -\frac{2}{2}, y = \frac{7}{2}$$

$$x = -1, y = \frac{7}{2}$$

$$\left(-1, \frac{7}{2}\right)$$

mid point of DB

$$x = \frac{0+2}{2}, y = \frac{5+8}{2}$$

$$x = \frac{2}{2}, y = \frac{13}{2}$$

$$x = 1, y = \frac{13}{2}$$

$$\left(1, \frac{13}{2}\right)$$

Hence the coordinates of C and E

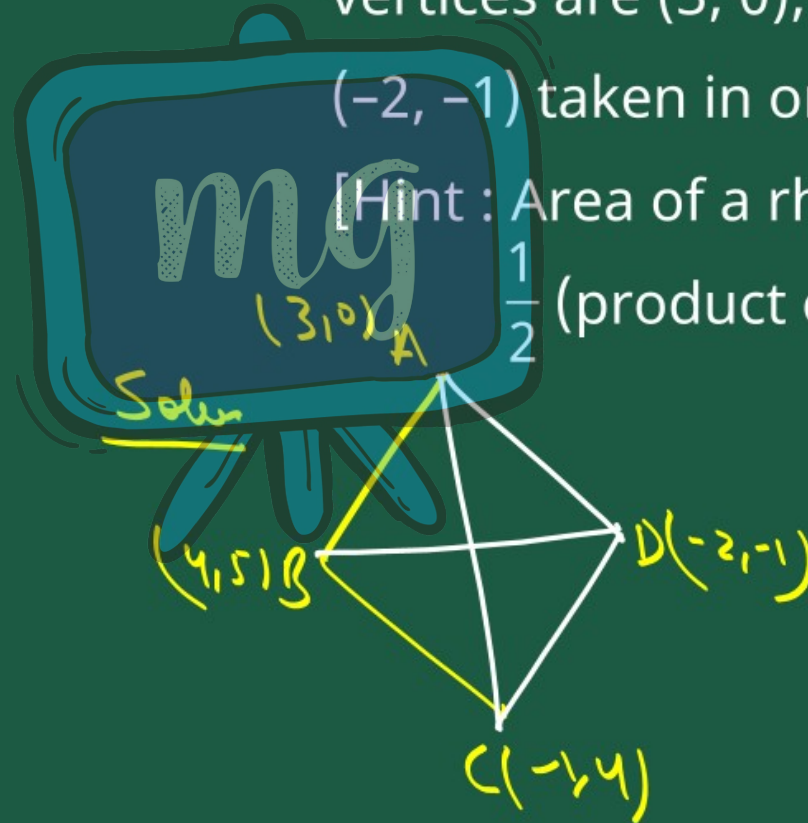
are $(-1, 7\frac{1}{2})$ and $(1, 13\frac{1}{2})$

The points that divides the line
into 4 equal parts are

$(0, 5)$, $(-1, 7\frac{1}{2})$ and $(1, 13\frac{1}{2})$

10. Find the area of a rhombus if its vertices are $(3, 0)$, $(4, 5)$, $(-1, 4)$ and $(-2, -1)$ taken in order.

[Hint : Area of a rhombus = $\frac{1}{2}$ (product of its diagonals)]



By distance formula.

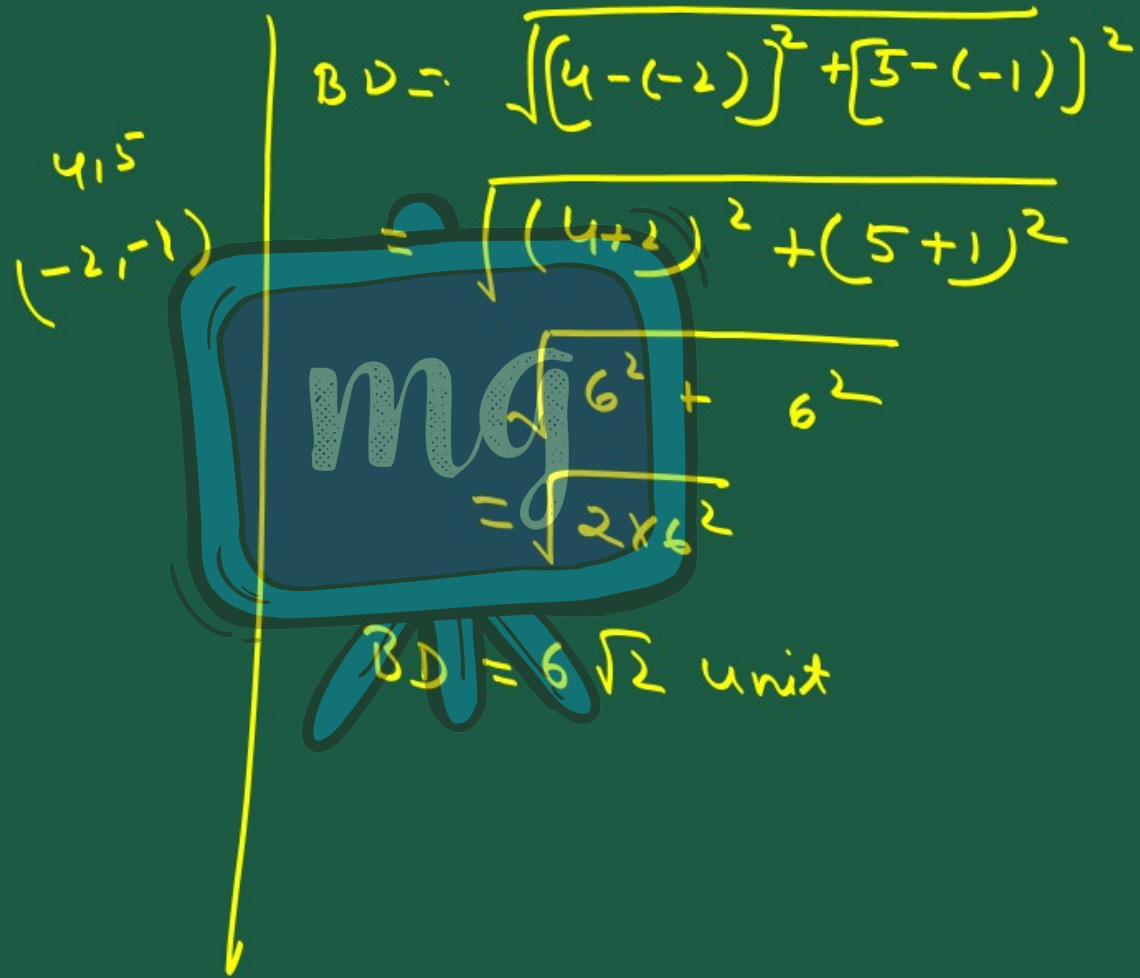
$$\text{dis} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

To find the distance of AC

$$AC = \sqrt{[3 - (-1)]^2 + (0 - 4)^2}$$

$$= \sqrt{(3+1)^2 + (-4)^2}$$

$$AC = \sqrt{4^2 + 4^2} = \sqrt{2 \times 4^2} = 4\sqrt{2} \text{ unit.}$$



A hand-drawn diagram on a green background. A vertical yellow line represents the y-axis, with a downward-pointing arrow at the bottom. To the left of the y-axis, the coordinates (4, 5) and (-2, -1) are written in yellow. A blue character with a white 'mg' logo on its chest is holding a blue sign. The sign contains the following mathematical steps in yellow:

$$BD = \sqrt{[4 - (-2)]^2 + [5 - (-1)]^2}$$
$$= \sqrt{(4+2)^2 + (5+1)^2}$$
$$= \sqrt{6^2 + 6^2}$$
$$= \sqrt{2 \times 6^2}$$

Below the sign, the final result is written:

$$BD = 6\sqrt{2} \text{ unit}$$

Area of Rhombus:

$$= \frac{1}{2} \times d_1 \times d_2$$

$$= \frac{1}{2} \times 4\sqrt{2} \times 6\sqrt{2}$$

Ar. = 24 unit²