Udaan

2026

Coordinate Geometry

MATHS LECTURE-1

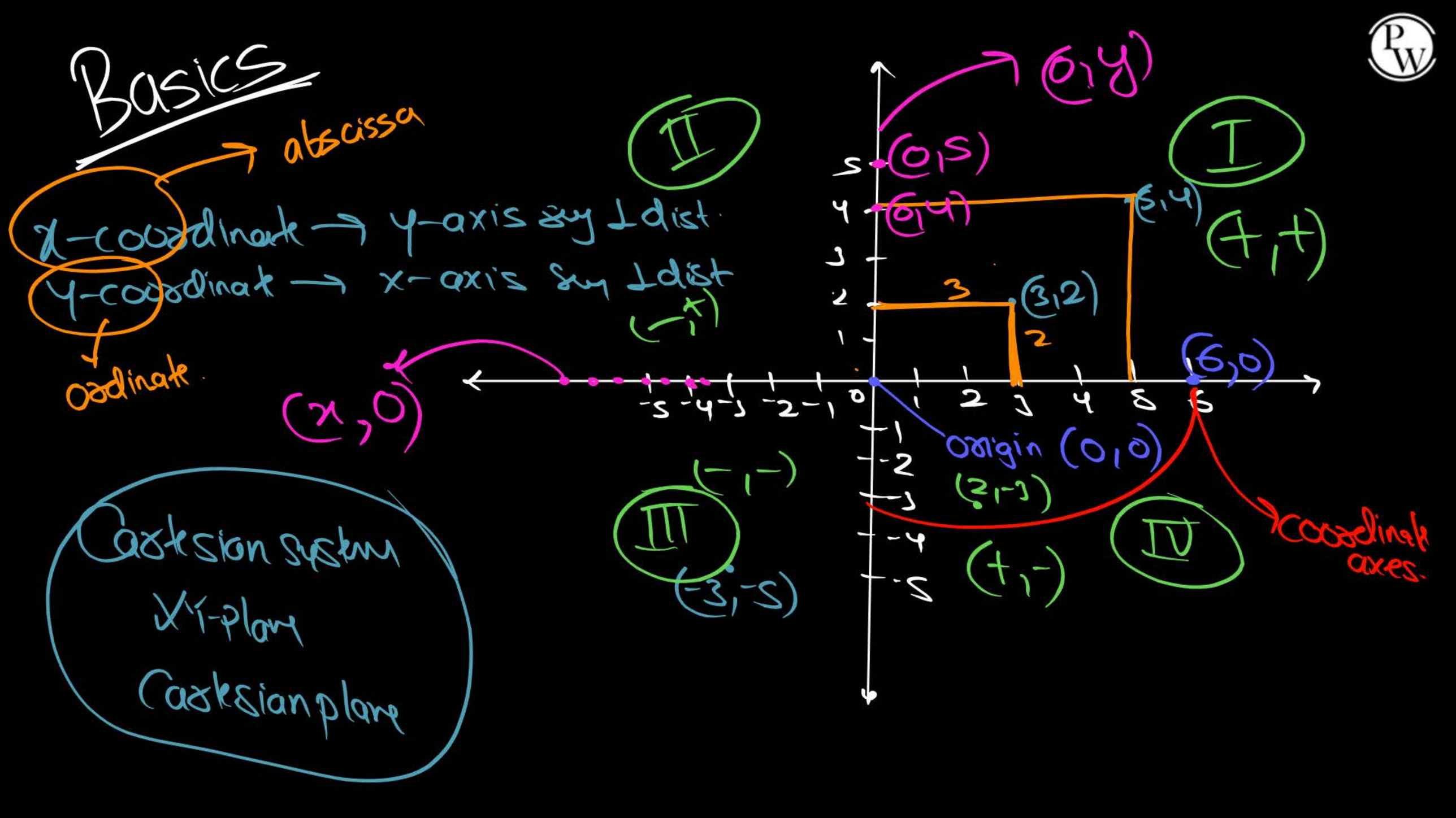
BY-RITIK SIR

Topics *to be covered*

A Basics of class 9th

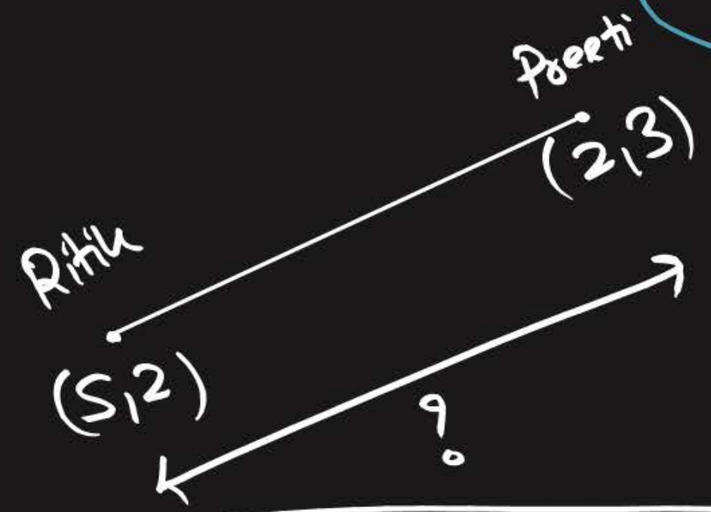
B Distance formula.

Basics


abscissa
x-coordinate → y-axis ⊥ dist.
y-coordinate → x-axis ⊥ dist
ordinate
(0,y)
(0,5)
(0,4)
(5,4)
(3,2)
3
2
(6,0)
(x,0)
origin (0,0)
(2,-3)
(-,+)
(+,+)
(-,-)
(+,-)
(-3,-5)
I
II
III
IV
coordinate axes.
Cartesian system
XY-plane
Cartesian plane

DISTANCE BETWEEN TWO POINTS

$$\sqrt{(\text{Difference of abscissae})^2 + (\text{Difference of ordinates})^2}$$



$$RP = \sqrt{(3-2)^2 + (2-5)^2}$$

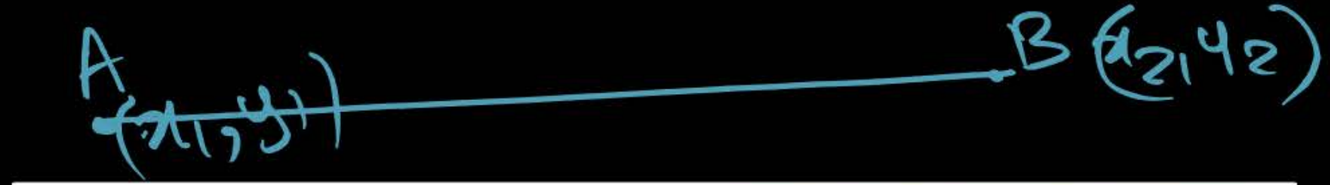
$$= \sqrt{1+9} = \boxed{\sqrt{10} \text{ units}}$$

Q. A(5,-2) B(-7,-3)

$$AB = \sqrt{(-3--2)^2 + (-7-5)^2}$$

$$= \sqrt{1+144}$$

$$= \boxed{\sqrt{145} \text{ units}}$$



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

distance formula

#Q. Find the distance between the points

(i) P(−6, 7) and Q(−1, −5)

$$PQ = \sqrt{(-1--6)^2 + (-5-7)^2}$$

$$= \sqrt{25 + 144}$$

$$= \sqrt{169}$$

AB = 13 units

(ii) R(a + b, a − b) and S(a − b, −a −b)

$$RS = \sqrt{[(-a-b)-(a-b)]^2 + [(a-b)-(a+b)]^2}$$

$$= \sqrt{(-a-b-a+b)^2 + (a-b-a-b)^2}$$

$$= \sqrt{(-2a)^2 + (-2b)^2}$$

$$= \sqrt{4a^2 + 4b^2}$$

$$= \sqrt{4(a^2+b^2)} = \sqrt{4}\sqrt{a^2+b^2}$$

$$= \boxed{2\sqrt{a^2+b^2}}$$

$\sqrt{a^2 \cdot b^2} = \sqrt{a^2} \cdot \sqrt{b^2} = ab$

$\sqrt{(a+b)^2} = a+b$

$\sqrt{a^2+b^2} \neq \sqrt{a^2} + \sqrt{b^2}$

$\sqrt{a^2+b^2}$ XXX

Mistakes to avoid

#Q. Find the value of x, if the distance between the points (x, –1) and (3, 2) is 5.

$AB = 5$

$\sqrt{(2 - -1)^2 + (3 - x)^2} = (5)^2$

S.B.S

$9 + (3-x)^2 = 25$

$(3-x)^2 = 16$

$3 - x = \pm\sqrt{16}$

$3 - x = \pm 4$

$3 - x = 4$, $3 - x = -4$

$3 - 4 = x$ $\quad 3 + 4 = x$

$-1 = x$ $\quad 7 = x$

Ans: $-1, 7$

$PQ = \sqrt{a}$

S.B.S

$PQ^2 = a$

#Q. If the points A (4, 3) and B (x, 5) are on the circle with centre O(2, 3), find the value of x.

OA = OB (radius of same circle)

$\sqrt{(3-3)^2+(4-2)^2} = \sqrt{(5-3)^2+(x-2)^2}$

SDS

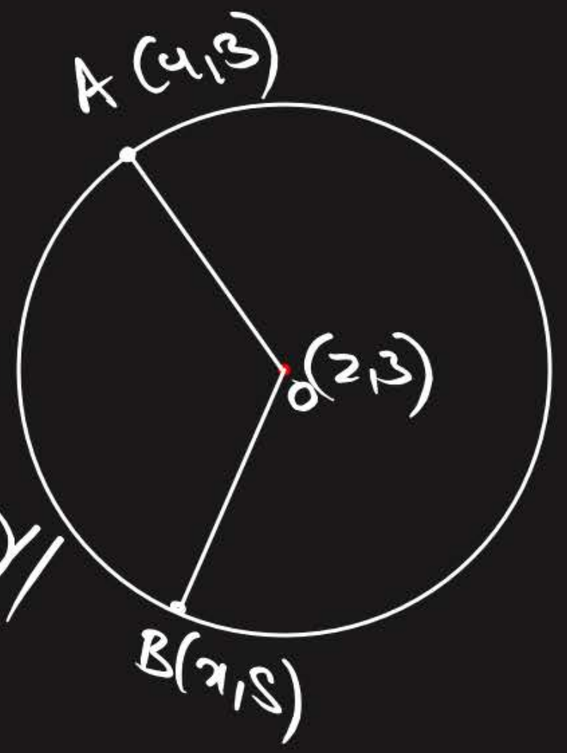
$0 + 4 = 4 + (x-2)^2$

$0 = (x-2)^2$

$\pm\sqrt{0} = x-2$

$0 = x-2$

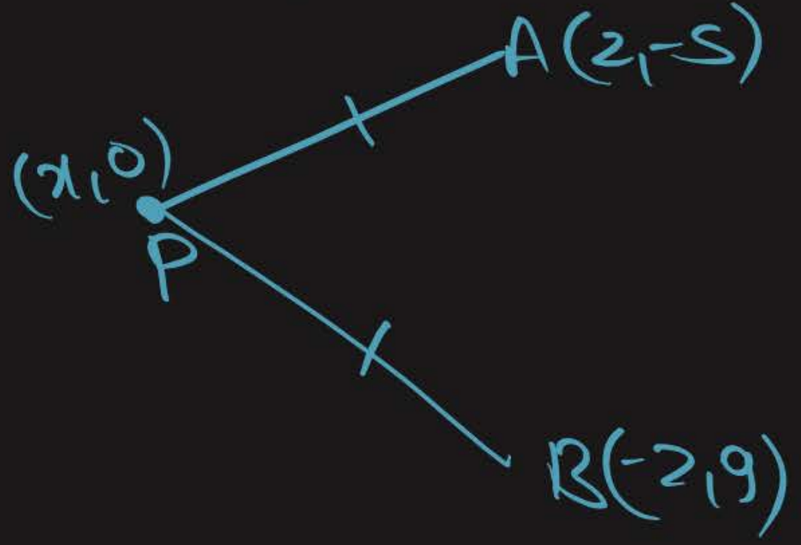
$2 = x$



point key coordinates (x, y) → equal distance.

#Q. Find a point on x-axis which is equidistant from A(2, –5) and B(–2, 9).

Let the point on x-axis be $P(x, 0)$



$PA = PB$

$\Rightarrow \boxed{PA^2 = PB^2}$

$(0 - -5)^2 + (x - 2)^2 = (0 - 9)^2 + (x - -2)^2$

$25 + x^2 + 4 - 4x = 81 + x^2 + 4 + 4x$

$25 - 4x = 81 + 4x$

$25 - 81 = 4x + 4x$

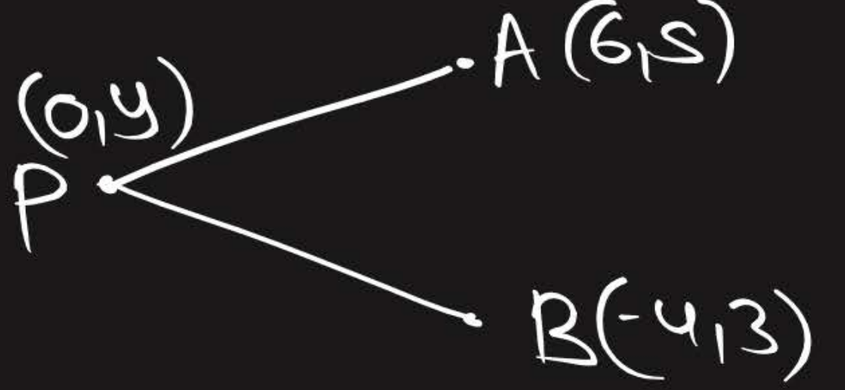
$-56 = 8x$

$-7 = x$ //

Ans: $P(-7, 0)$

#Q. Find a point on the y-axis which is equidistant from the point A(6, 5) and B(–4, 3).

y-axis → P(0, y)



$PA = PB$

$= PA^2 = PB^2$

$(5-y)^2 + (6-0)^2 = (3-y)^2 + (4-0)^2$

$25 + y^2 - 10y + 36 = 9 + y^2 - 6y + 16$

$25 - 10y + 36 = 9 - 6y + 16$

$25 + 36 - 9 - 16 = -6y + 10y$

$61 - 25 = 4y$

$36 = 4y$

$9 = y$

Ans: P(0, 9)

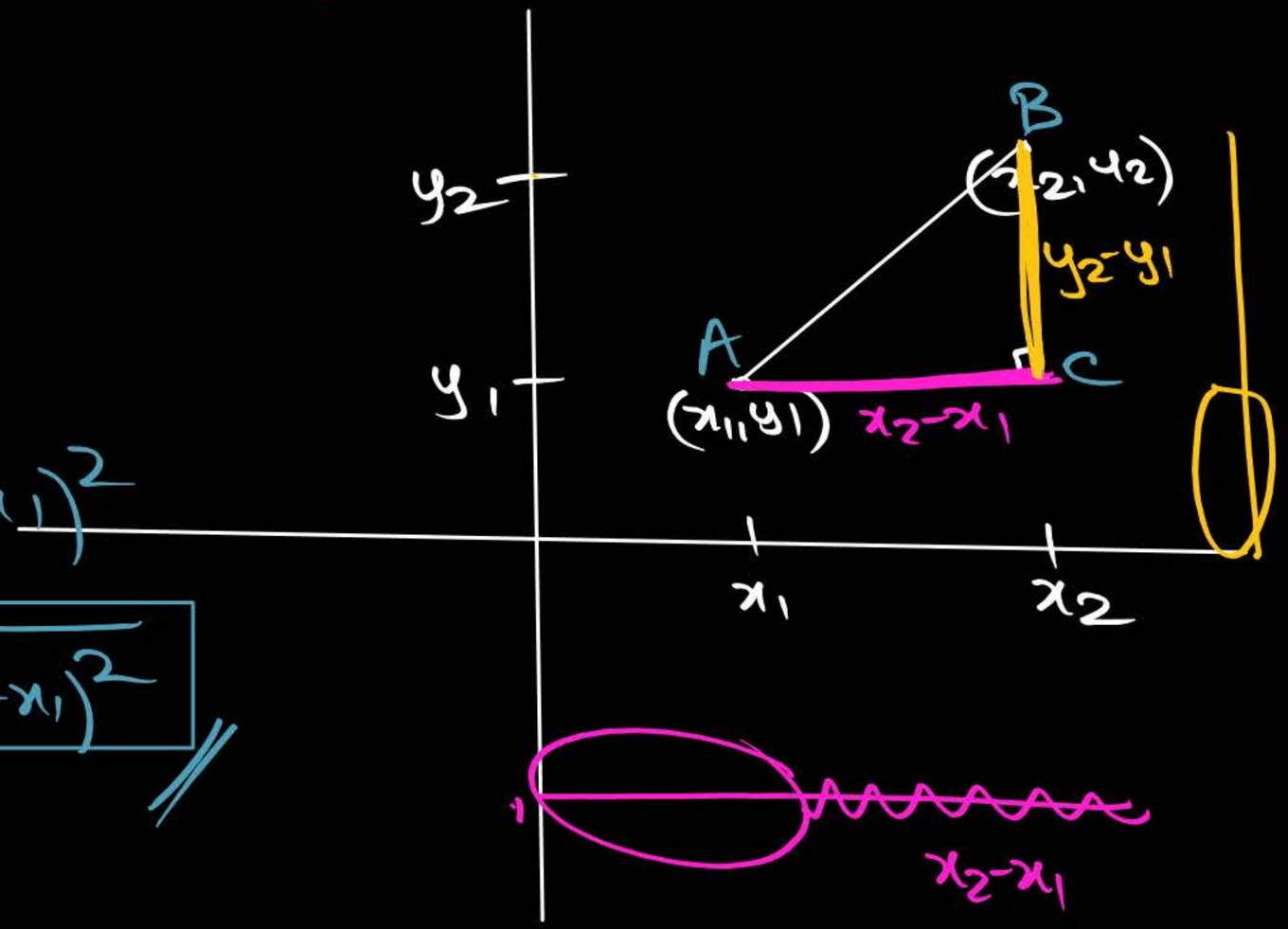
Proof of distance formula.

P.T

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

$AB^2 = (y_2 - y_1)^2 + (x_2 - x_1)^2$

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



#Q. The x-coordinate of a point P is twice its y-coordinate. If P is equidistant from Q(2,–5) and R(–3, 6), then find the coordinates of P.

#Gph


WORK HARD
DREAM BIG
NEVER GIVE UP

RITIK SIR

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Thank You