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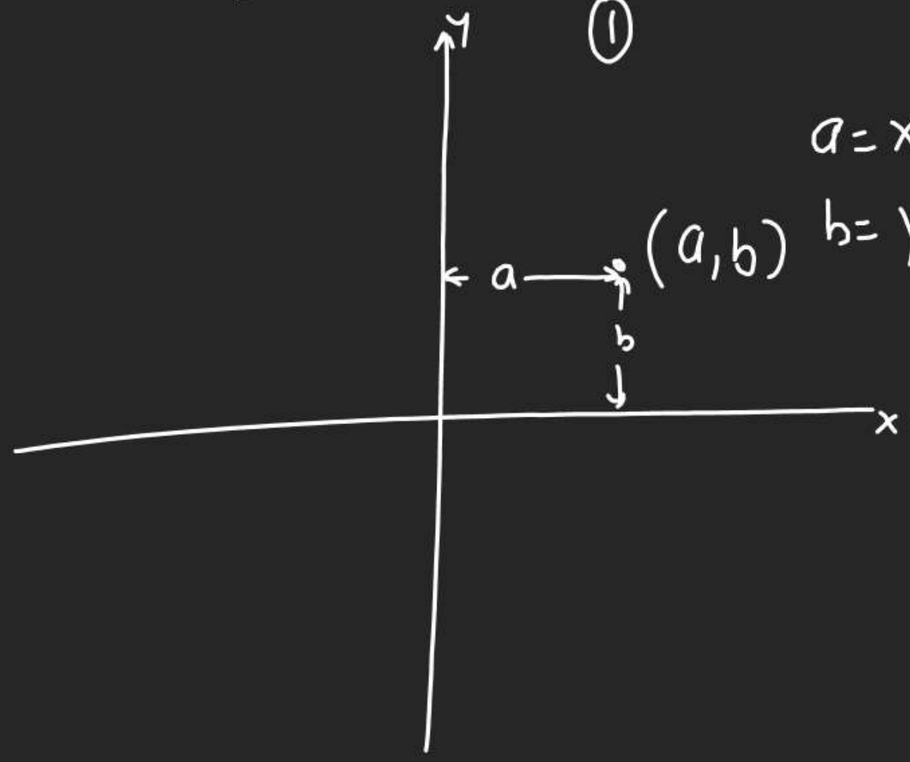
Straight Line.

Coordinate System

①



a = x coord. = distance of Pt from y Axis

b = y coord. = dist. of Pt. from x Axis

② Quadrant System

2nd	1st
(-, +)	(+, +)
3rd	4th
(-, -)	(+, -)

Q1. (3, -3) is ... Quad?

x = +, y = - (4th)

Q2. (-3, 4) is .... Quad

x = -, y = + (2nd)

Q3 (-2, -5) .... Quad

(x = -ve, y = -ve) 3rd Quad

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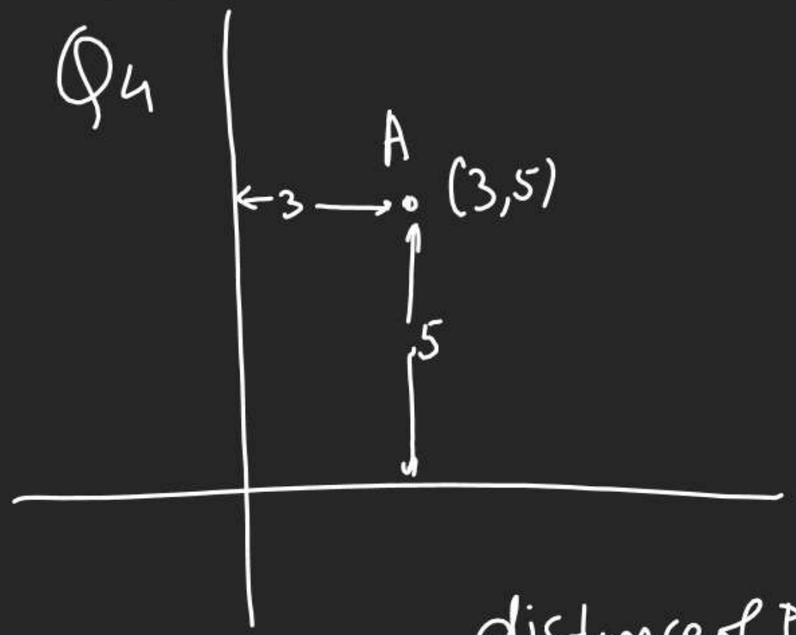
Q4



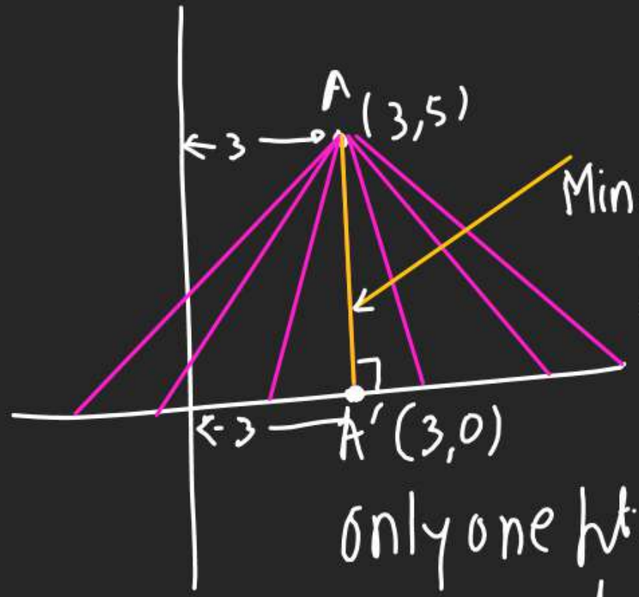
distance of Pt. A from.

A) x Axis ?

B) y Axis ?

Ans 5, 3

Q5 ? From (3,5) how many Pts on x Axis are at distance 5 units ?



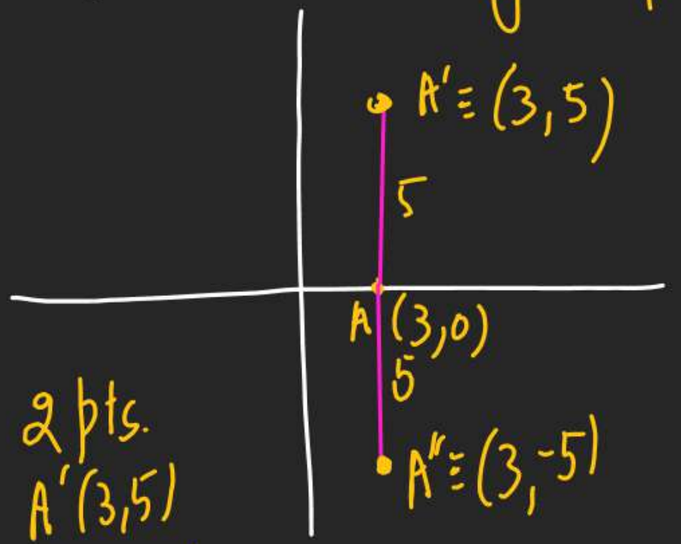
only one Pt on x Axis at a dist. of 5 units

$A' \equiv (3,0)$

Rem :-

Σ distance is Min. distance always

Q How many Pt. in Coord. System are at 5 unit distance from (3,0) along with y Axis ?



2 pts.

A'(3,5)

A''(3,-5)

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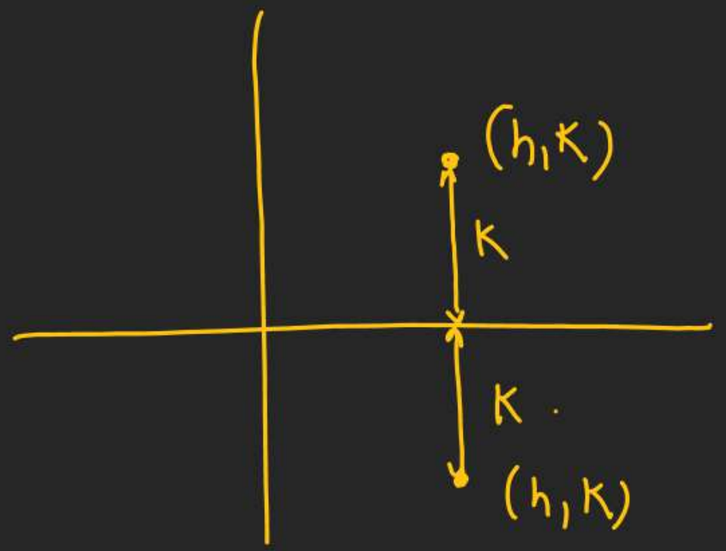
Q Distance of Pt. (h, K) from X Axis ?



$\therefore$ distance $= |K|$

Q Distance of Pt $(3, -5)$ from X Axis ?

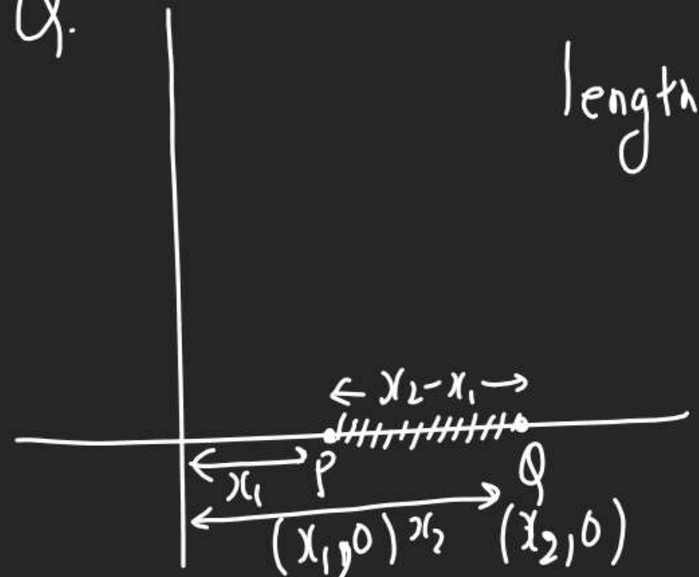
dist $= |-5| = 5$

Rem:-

Distance of (h, K) from X Axis $= |K|$

" " from Y Axis $= |h|$

Q.



Ans $= x_2 - x_1$

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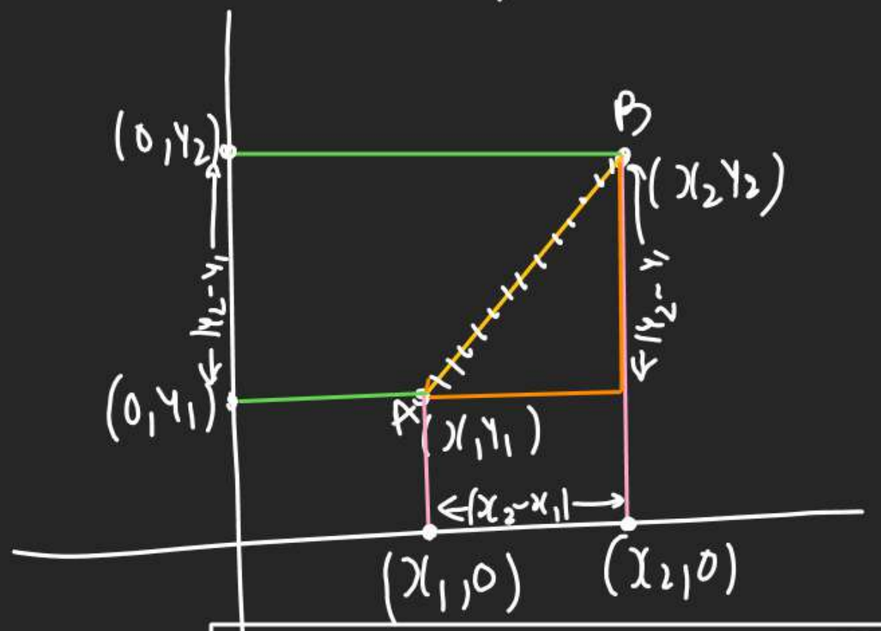
Q If there are 2 pts on X Axis

? $(x_1, 0)$ & $(x_2, 0)$ distance PQ = ?

No Position told to us.

$\therefore PQ = |x_2 - x_1|$

Q distance bet^n (x_1, y_1) & (x_2, y_2)



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

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

Q distance bet^n (2, 0) & (−5, 0) in ?

dist. $= |2 - (-5)| = 7$

dist $= |-5 - 2| = |-7| = 7$

Rem:- dist. bet^n $(x_1, 0)$ & $(x_2, 0)$ is $|x_2 - x_1|$

dist. bet^n $(0, y_1)$ & $(0, y_2)$ is $|y_2 - y_1|$

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Q dist. bet^n $(2,13), (-4,2) = ?$

$$\text{dist} = \sqrt{(13-2)^2 + (2-(-4))^2}$$

$$= \sqrt{121 + 36}$$

$$= \sqrt{157}$$

$|-2| = -(-2)$
$= 2$

Q Dist. bet^n $(\tan\alpha, 2)$ & $(0,1)$ is? $\left(\frac{\pi}{2} < \alpha < \pi\right)$

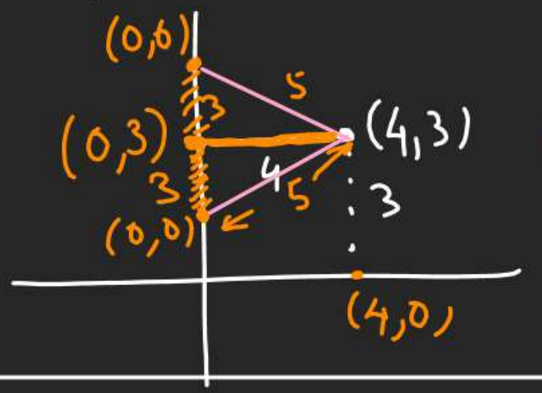
α = 2nd Quad
Secα = -ve

$$\text{Dist} = \sqrt{(\tan\alpha - 0)^2 + (2-1)^2}$$

$$= \sqrt{\sec^2\alpha} = |\sec\alpha|$$

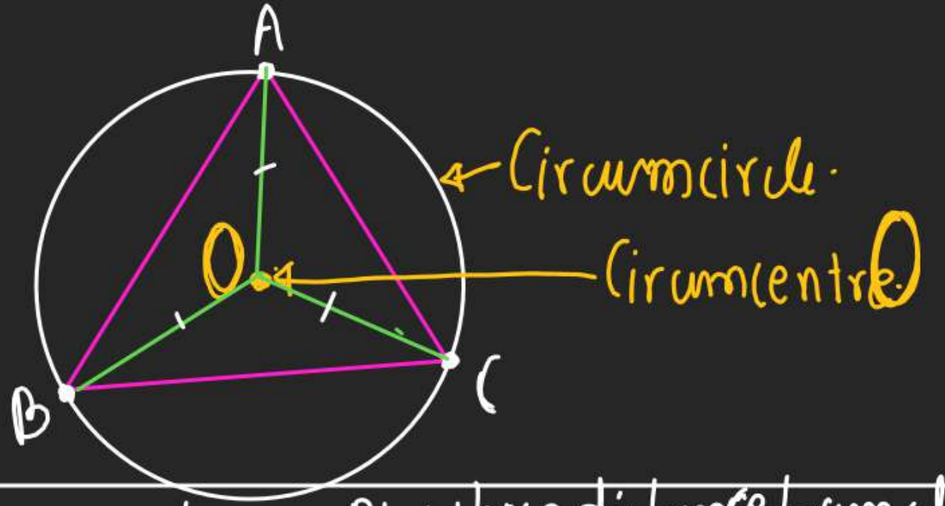
$$= -\sec\alpha$$

Q Pts on y Axis at 5 units distance from (4,3).



(0,0) & (0,6)

Sol: We will use distance formula in Circumcentre



Circumcentre is a Pt whose distance from all 3 vertices are equal. OA = OB = OC

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Whenever Circumcentre is Asked we Solve:

1) $OA = OB = OC$.

2) $OA^2 = OB^2$

3) Eq 1

$OB^2 = OC^2$ → Eq ②

4) Eq 1 & Eq ② Solve → (circumcentre)

Q Find circumcentre of Δ whose Vertices are A(-1,5), B(5,-1) & C(6,6)

① let circumcentre is $(x,y) \equiv O$

② $OA = OB$ & $OB = OC$

$(x,y) \equiv (-1,5)$ $(x,y) \equiv (5,-1)$

$OA = OB$

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

(3) $x^2+2x+1+y^2-10y+25$

$= x^2-10x+25+y^2+2y+1$

$12x - 12y = 0$

$x = y$ → ①

$(x,y)(5,-1)$

$OB = OC$ $(x,y) \equiv (6,6)$

$\sqrt{(x-5)^2+(y+1)^2} = \sqrt{(x-6)^2+(y-6)^2}$

$x^2-10x+25+y^2+2y+1$

$= x^2-12x+36+y^2-12y+36$

$2x + 14y = 46$

$x + 7y = 23$ → ②

4)

$y + 7y = 23 \Rightarrow 8y = 23 \Rightarrow y = \frac{23}{8}$

$x = y = \frac{23}{8}$

$\therefore O \equiv (x,y) = \left(\frac{23}{8}, \frac{23}{8}\right)$

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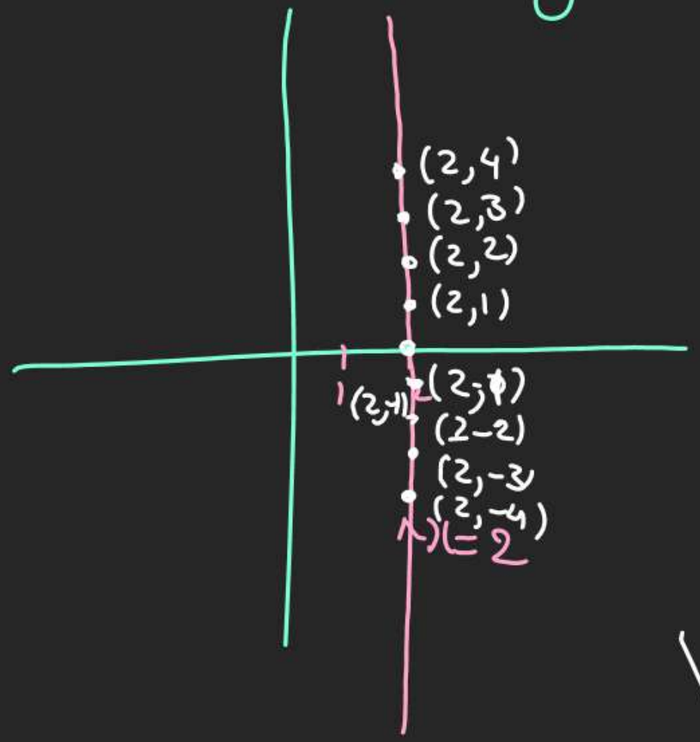
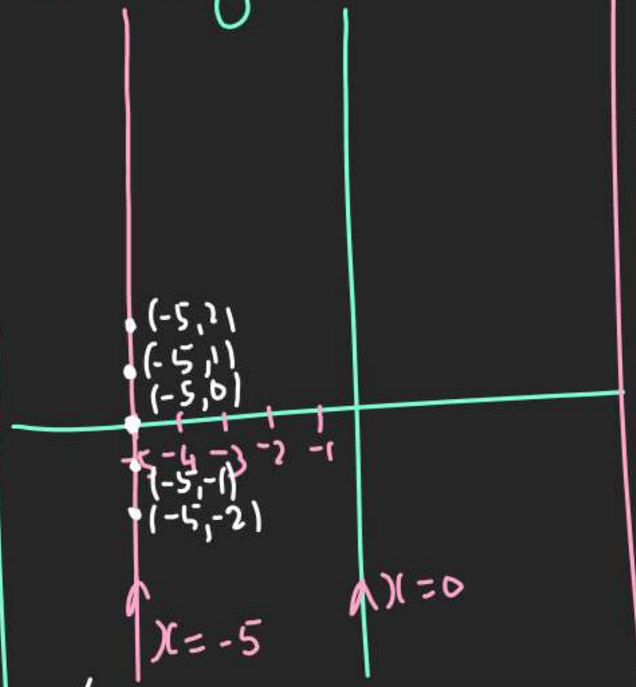
Bahhbuttl Baten.

Lines.

(A) $x = 2$ Draw graph.



$x = -5$ graph

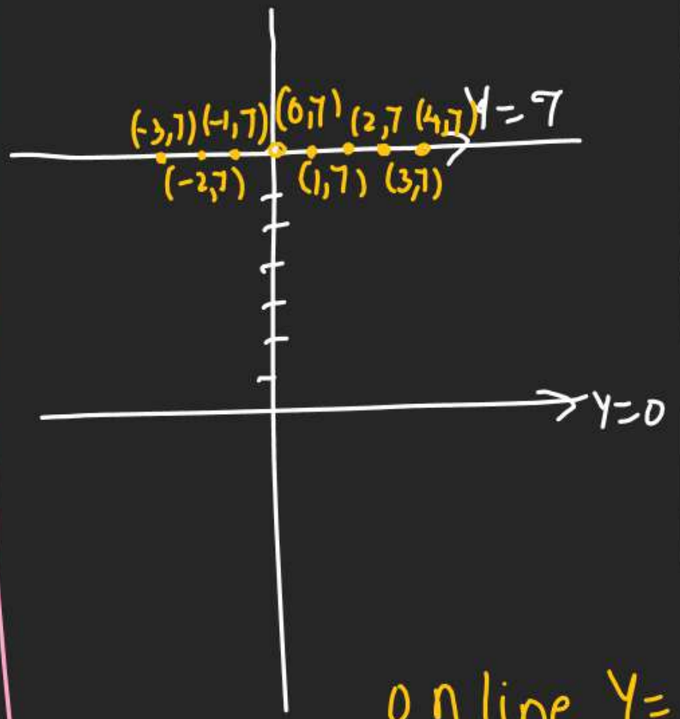


Any Pt. on Line $X = K$ has

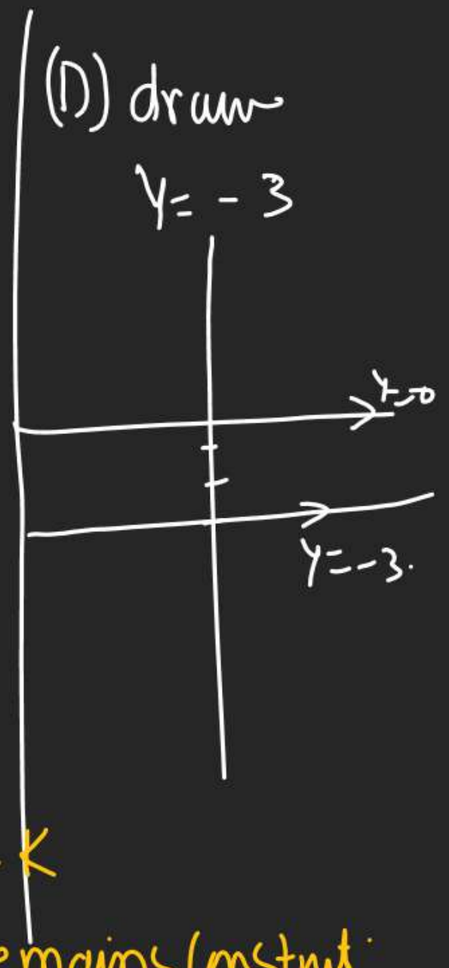
X Coord $\equiv K$

Coord $\equiv (K, Y)$

(C) Draw $Y = 7$



(D) draw $Y = -3$



online $Y = K$

Y Coord remains constant.

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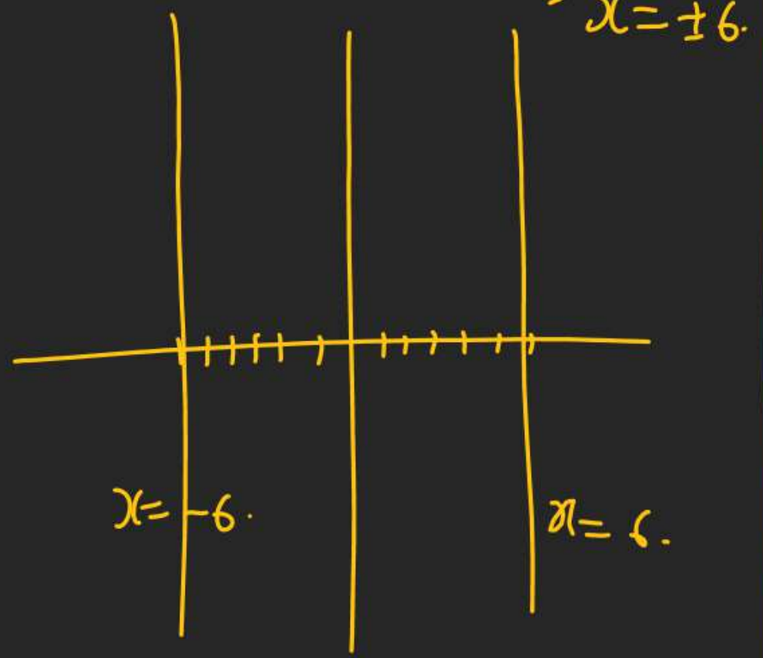
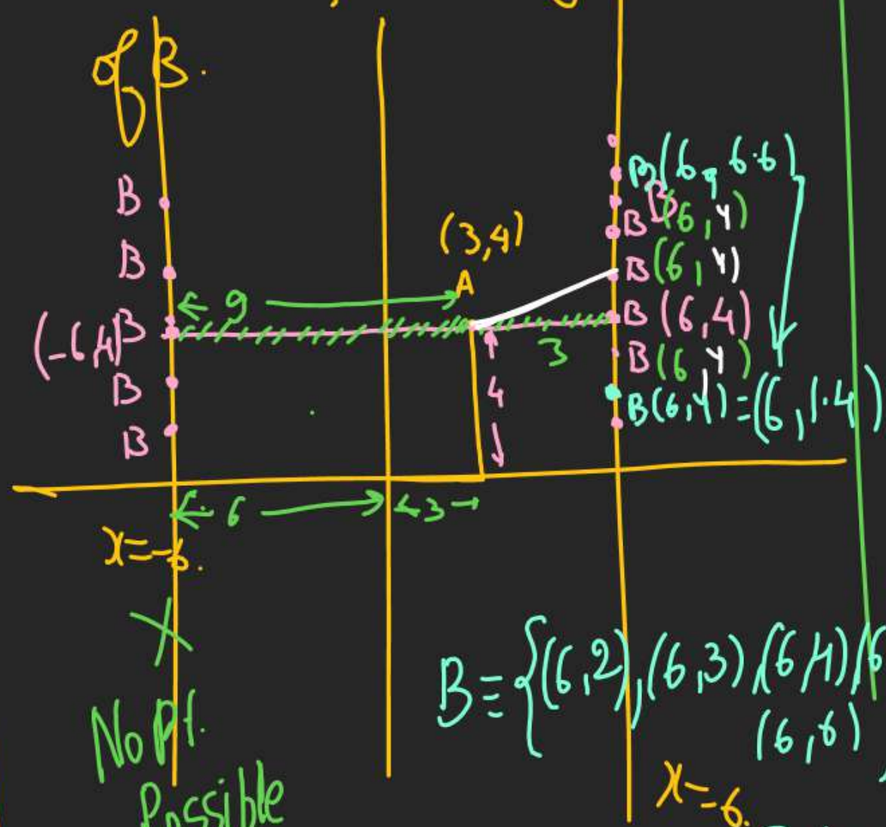
Q draw $|x|=6$ → $x=\pm 6$.



Q let A ≡ (3,4) & B is a variable Pt. at line $|x|=6$ such that $AB \le 4$ find Integral Positions of B.



No Pt. Possible

$B \equiv \{(6,2),(6,3),(6,4),(6,5),(6,6)\}$

Integers $Y=\{2,3,4,5,6\}$

① let any Pt. $B \equiv (6,Y)$

② Cond^n of Q.s.

$AB \le 4$ $\quad \sqrt{6.25} = 2.5$

$\sqrt{(6-3)^2+(Y-4)^2} \le 4$

$9+(Y-4)^2 \le 16$

$(Y-4)^2-7 \le 0$

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

$(Y-(4-\sqrt{7}))(Y-(4+\sqrt{7})) \le 0$

$4-\sqrt{7} \le Y \le 4+\sqrt{7}$

$4-2.6 \le Y \le 4+2.6$

$1.4 \le Y \le 6.6$

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Geometrical Figures

- Δ
  - Equilateral Δ
  - Isosceles
  - Scelene
  - Rt. angle Δ
  - Acute angle Δ
- Quadrilateral

(1) Equilateral Δ

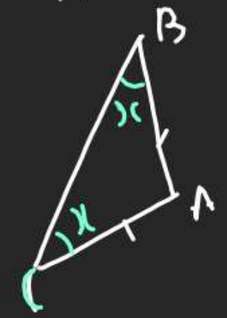
1) $AB = BC = CA$
2) all angle 60°

(2) Isosceles Δ

2 Sides equal

$AB = BC \neq CA$

$AB = AC \neq BC$



(3) Rt. angle Δ

$AB \perp BC$

Q $AB^2 + BC^2 = CA^2$ in Rt. angled at ?

Rt at B