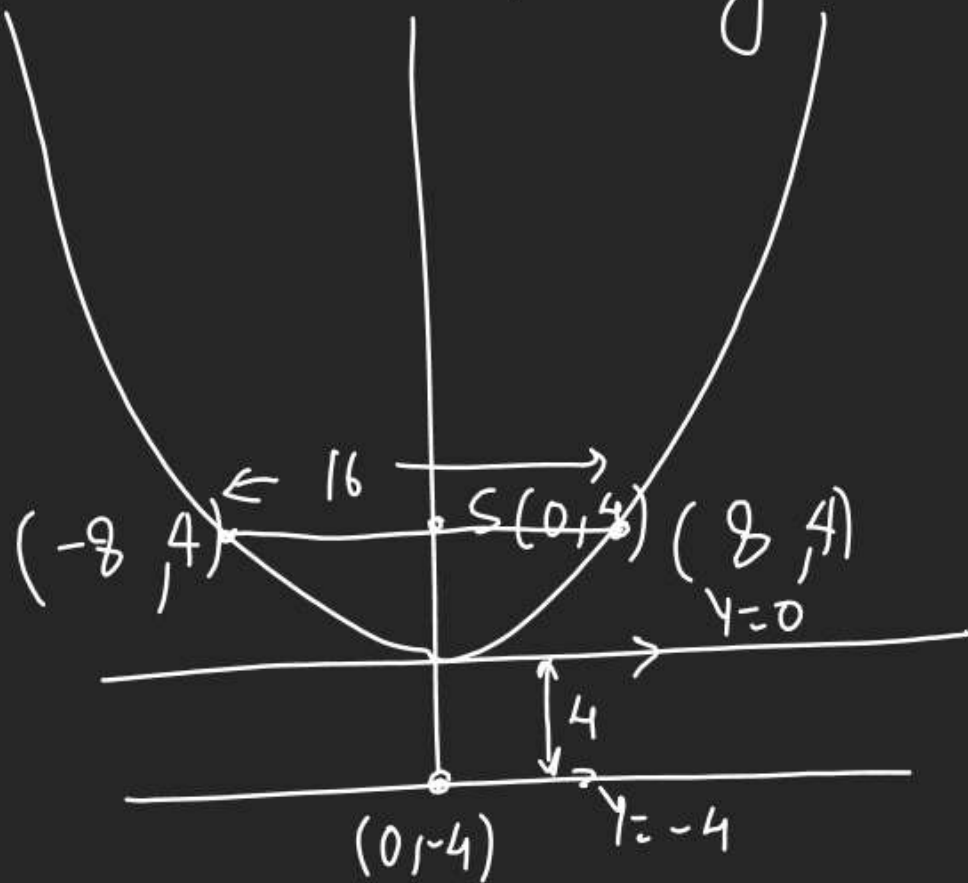


Q find all Terms for $x^2 = 16y$

Q $x^2 = 16y$

$x^2 = 4ay \Rightarrow a = 4$

opening to +ve y Axis



(1) Axis $\Rightarrow x = 0$

(2) Dir $\Rightarrow y = -4$

(3) T.V $\Rightarrow y = 0$

(4) Focus $S = (0,4)$

$y = 4$ (5) F.D. $\Rightarrow (0,-4)$

$x^2 = 16y$ (6) LR $\Rightarrow (8,4) (-8,4)$

$x^2 = 16 \times 4$ (7) LLR $\Rightarrow 16$

$x = \pm 8$

(1) Vertex \Rightarrow	$(x=0)$ $x-4=0$	$y=0$ $y+1=0$	Ver. $(4,-1)$
(2) Axis	$y=0$ $y+1=0$		$y=-1$
(3) Directrix	$x=-a$	$x-4=-\frac{1}{4}$	$x=\frac{15}{4}$
(4) Focus	$x=-a, y=0$	$x-4=\frac{1}{4}, y+1=0$	$(\frac{17}{4}, -1)$ $x=-a$

Q If $y^2 + 2y - x + 5 = 0$ Rep. Parabola

Find its vertex, axis of symm

Focus, Eqⁿ of Dir, LLR, LR?

$y^2 + 2y - x + 5 = 0$

$\Rightarrow y^2 + 2y + 1 = x - 5 + 1$

$\Rightarrow (y+1)^2 = x(-4) \Rightarrow y^2 = 4Ax$

$y = y+1, x = x-4$ & $4A = -1$

$A = -\frac{1}{4}$

(5) LLR = 1

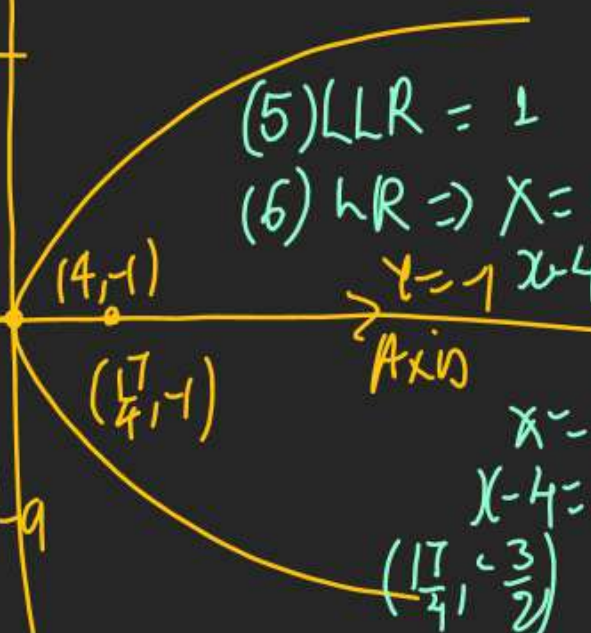
(6) LR $\Rightarrow x = A, y = 2A$

$y = -1, x-4 = -\frac{1}{4}, y = \frac{2}{4} \Rightarrow \left\{ \frac{17}{4}, \frac{1}{2} \right\}$

$x = A, y = -2A$

$x-4 = \frac{1}{4}, y+1 = -\frac{2}{4}$

$\left(\frac{17}{4}, -\frac{3}{2} \right)$



Q 1 LR for $4y^2 + 12x - 20y + 17 = 0$

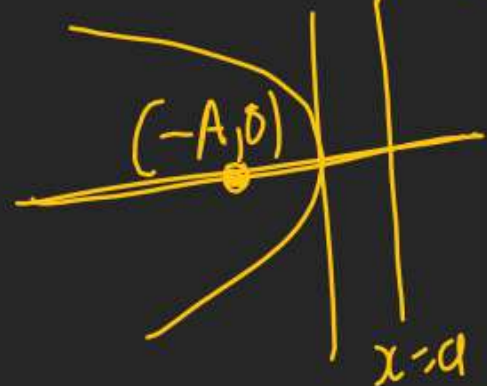
$$4y^2 - 20y = -12x - 17$$

$$4(y^2 - 5y + \frac{25}{4}) = -12x - 17 + 25$$

$$(\frac{5}{2})^2$$

$$4(y - \frac{5}{2})^2 = -12x + 8$$

$$4(y - \frac{5}{2})^2 = -3(x - \frac{2}{3})$$



$$y^2 = -4Ax$$

$$LLR = 4A = 3$$

$$(y - \frac{5}{2})^2 = -3(x - \frac{2}{3})$$

(A) Vertex $X=0$ $Y=0$

$$x - \frac{2}{3} = 0, y - \frac{5}{2} = 0 \Rightarrow (\frac{2}{3}, \frac{5}{2}) \text{ vertex.}$$

(B) Axis $Y=0 \Rightarrow y - \frac{5}{2} = 0 \Rightarrow y = \frac{5}{2}$ or $2y - 5 = 0$

(C) Directrix $X = A \Rightarrow x - \frac{2}{3} = \frac{3}{4} \Rightarrow x = \frac{3}{4} + \frac{2}{3} = \frac{17}{12} \Rightarrow 12x - 17 = 0$

(D) Focus $X = -A, Y = 0$ $\left| \begin{array}{l} x - \frac{2}{3} = -\frac{3}{4} \Rightarrow x = \frac{2}{3} - \frac{3}{4} = \frac{8-9}{12} = -\frac{1}{12} \\ y - \frac{5}{2} = 0 \Rightarrow y = \frac{5}{2} \end{array} \right.$
 $(-\frac{1}{12}, \frac{5}{2})$

Q Consider Para.

$$x^2 - 4x - 5y - 1 = 0$$

A) Vertex of Para:

B) Focus "

C) Dir. "

D) LLR "

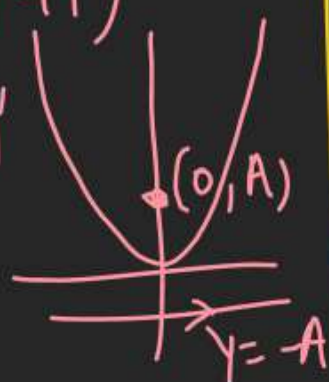
$$x^2 - 4x = 5y + 1$$

$$x^2 - 4x + 4 = 5y + 1 + 4$$

$$(x-2)^2 = 5(y+1)$$

$$x^2 = 4A y$$

$$4A = 5$$



$$\text{(1) Vertex } x=0, y=0$$

$$x-2=0, y+1=0 \Rightarrow (2, -1)$$

(2) Focus

$$x=0, y=A$$

$$x-2=0, y+1=\frac{5}{4} \Rightarrow (2, \frac{1}{4})$$

(3) Dir

$$y = -A \Rightarrow y+1 = -\frac{5}{4} \Rightarrow y = -\frac{9}{4}$$

$$(4) LLR \Rightarrow 4A = 5$$

Q Find vertex, Axis, Focus

HW Directrix, LLR for.

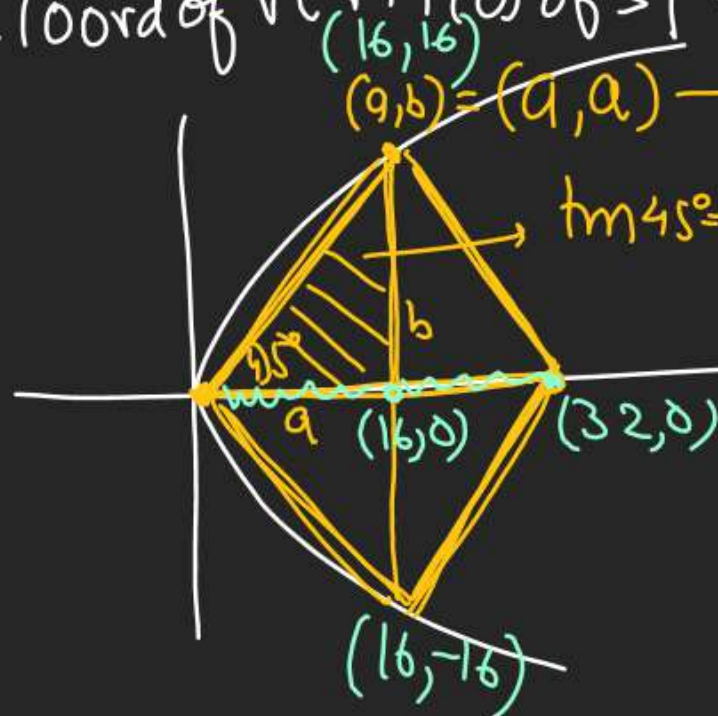
$$A) y^2 - 4x - 2y - 7 = 0$$

$$B) 9y^2 - 16x - 12y - 57 = 0$$

$$C) x^2 + 8x + 12y + 4 = 0$$

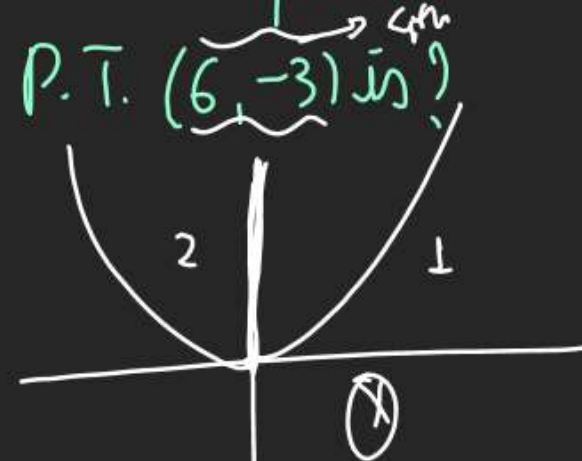
Q A Sq^r has one vertex at
Vertex of Parabola $y^2 = 16x$
& the diagonal thru the vertex
lies along the axis of Parabola. If ends of
other diagonal lie on Parabola.
The coord of vertices of Sq^r are?

$\Rightarrow 16, 16$
 $\Rightarrow 16, -16$
 $\Rightarrow 0, 0$
 $\Rightarrow 32, 0$



$(a,b) = (a,a) \rightarrow y^2 = 16x$
 $\tan 45^\circ = \frac{b}{a} = 1 \quad \begin{cases} a^2 = 16a \\ a^2 - 16a = 0 \\ a(a-16) = 0 \\ a = 0, a = 16. \end{cases}$

Q Eqⁿ of Parabola with
its vertex at origin
axis on y Axis &
P.T. $(6, -3)$ is?

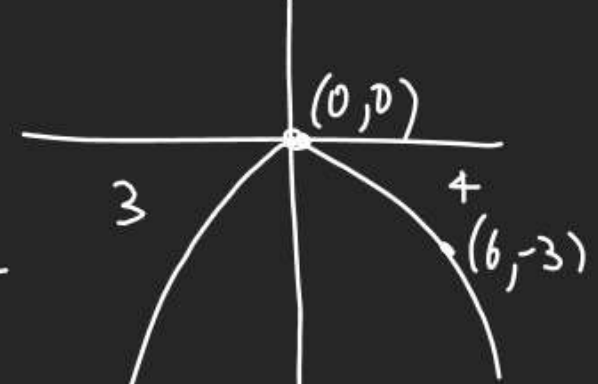


$x^2 = -4ay$ P.T. $(6, -3)$

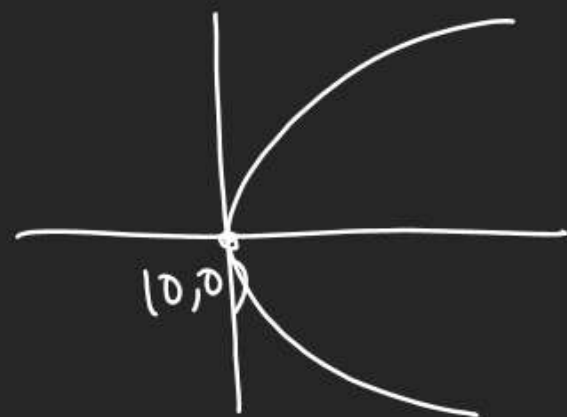
$36 = +4a(-3) \Rightarrow a = 3$

\therefore Parabola $\Rightarrow x^2 = -12y$

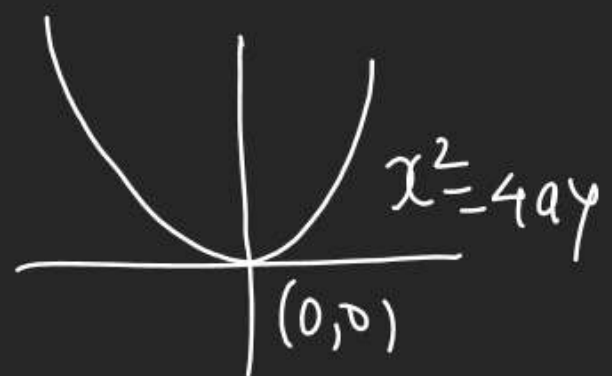
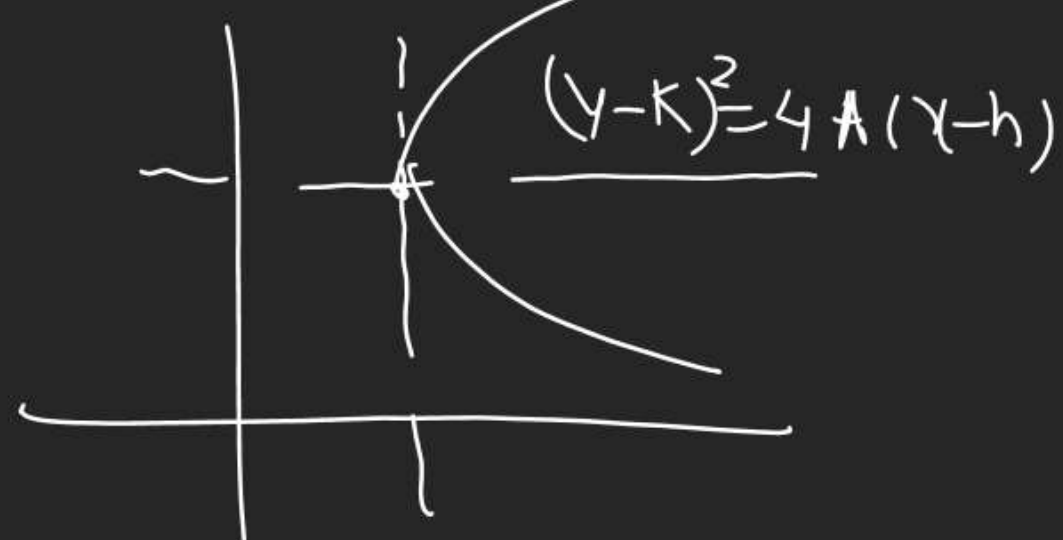
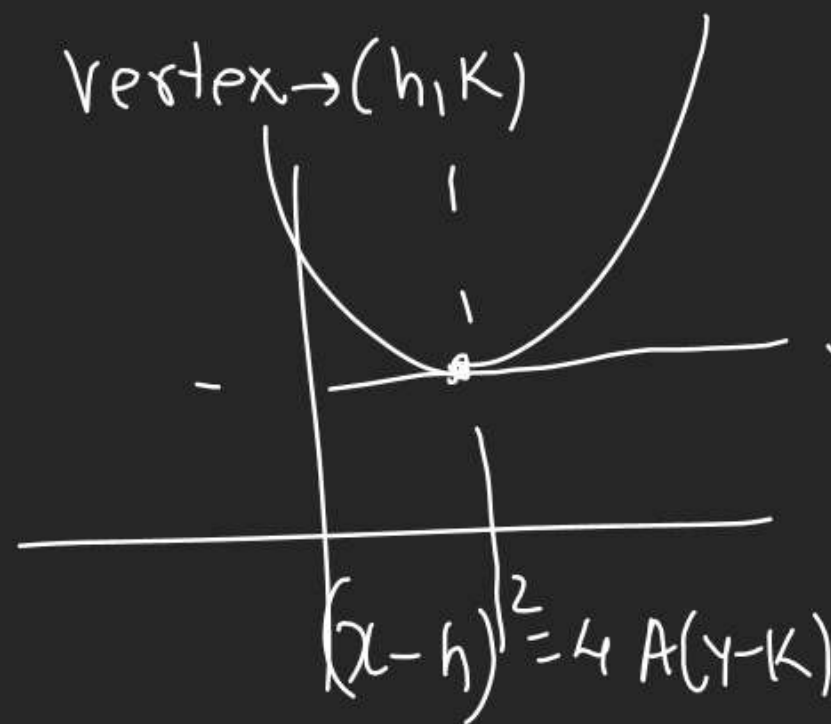
$x^2 = 4ay$
 $\Rightarrow x^2 = -4ay$
 $y^2 = 4ax$
 $y^2 = -4ax$



Shifting of vertex.



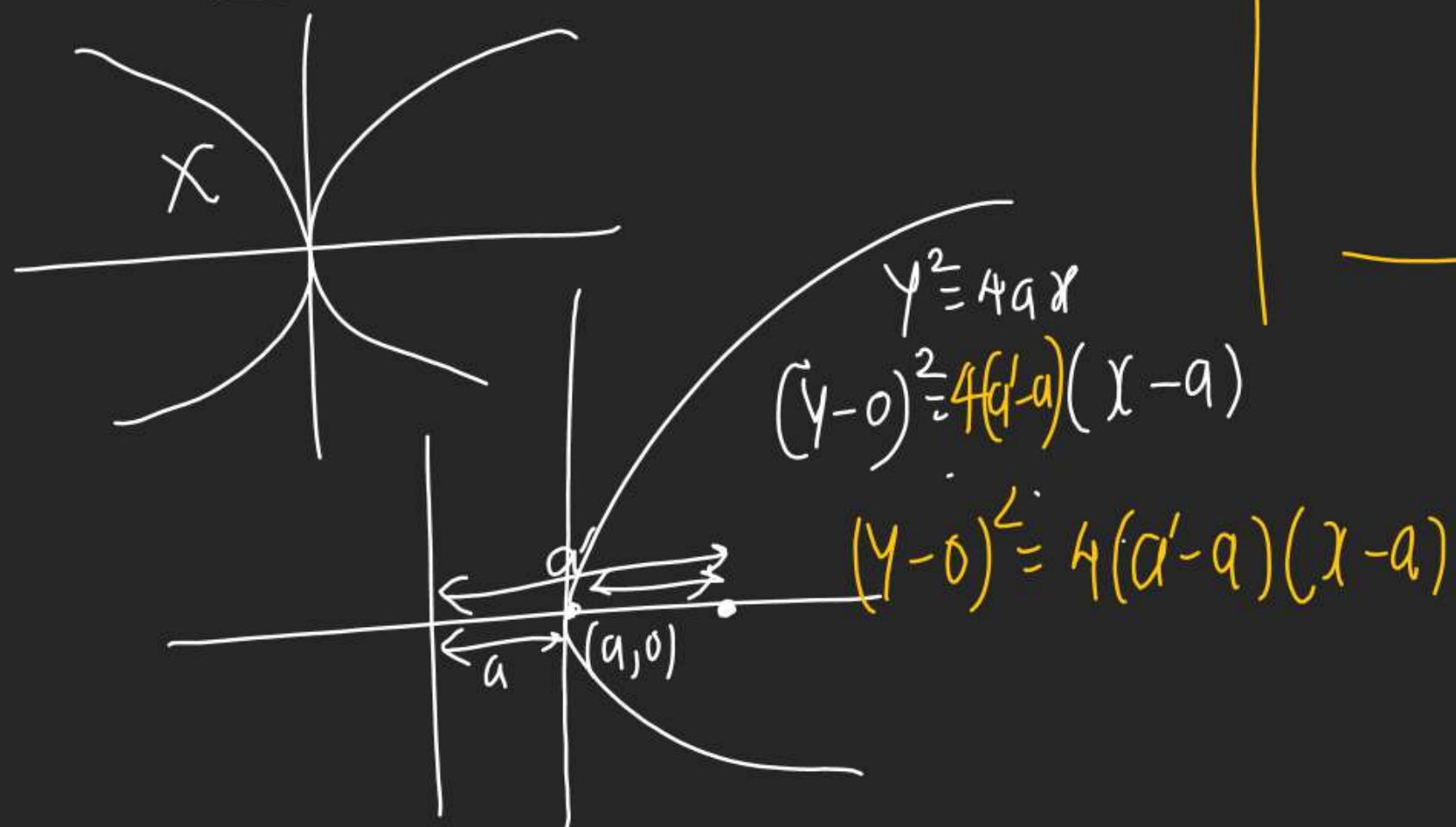
$$y^2 = 4ax$$

Vertex $\rightarrow (h, k)$ Vertex $\rightarrow (h, k)$ 

Q Find Eqⁿ of Parabola.

whose Axis is X Axis &

Vertex, focus are at distance a, a' from origin to the side.

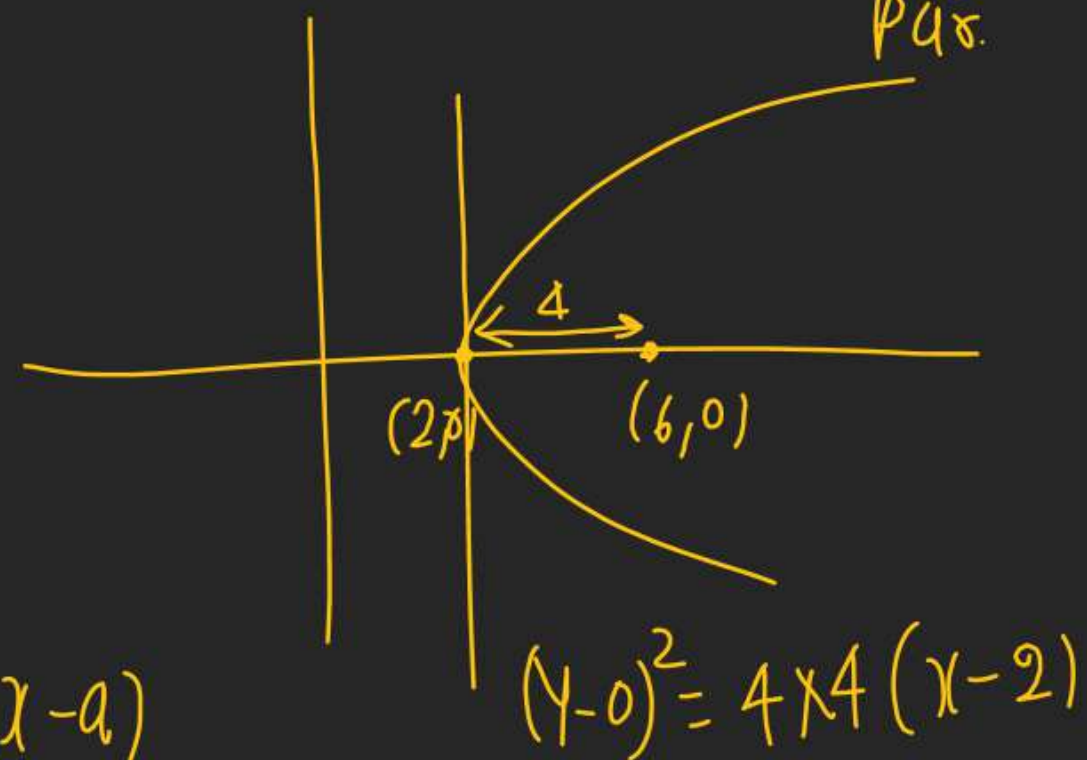


Q If vertex of Parabola

Shifted to $(2, 0)$ &

Axis is X Axis

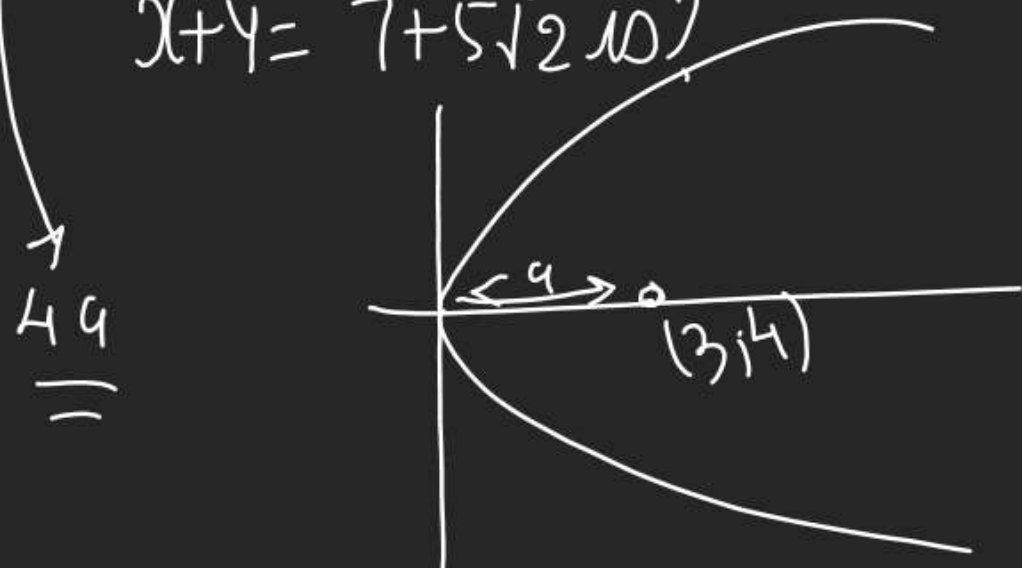
Focus is $(6, 0)$ find Eq of Par.



Q L.R. of Parabola whose

Focus is $(3, 4)$ & whose
tangent at vertex has Eqⁿ

$$x+y = 7+5\sqrt{2} \text{ is?}$$



$$x+y = 7+5\sqrt{2}$$

$$a = \pm \text{dist of } (3,4)$$

$$\text{Line } x+y-7-5\sqrt{2}=0$$

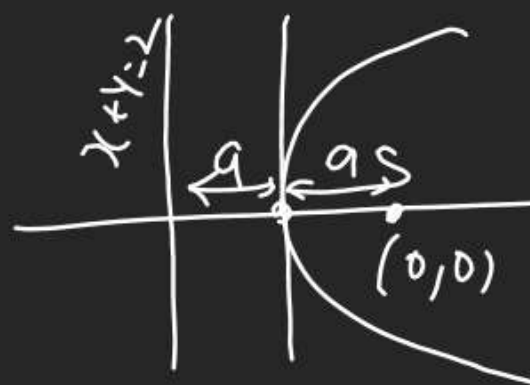
$$= \frac{|3+4-7-5\sqrt{2}|}{\sqrt{1^2+1^2}}$$

$$= \frac{5\sqrt{2}}{\sqrt{2}} = 5$$

$$L.R. = 4a = 20$$

Q Dir. of Parabola is $x+y=2$

if focus is origin then L.R.
of the Parabola is.



$$2a = \pm \text{dist. of } (0,0)$$

$$\text{from } x+y-2=0$$

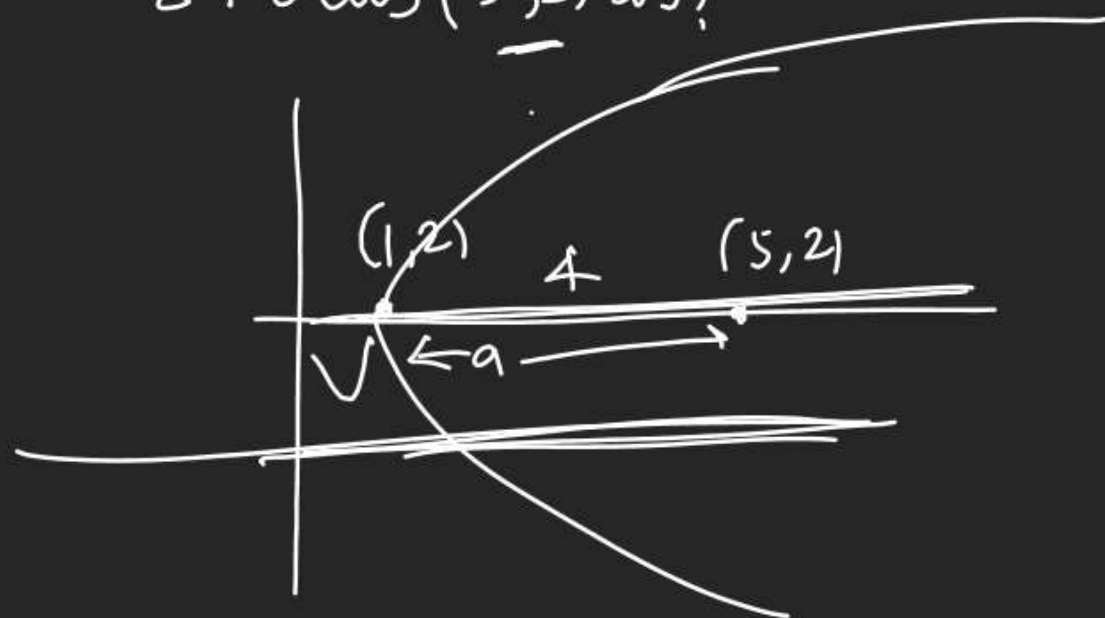
$$= \frac{|0+0-2|}{\sqrt{1^2+1^2}}$$

$$2a = \sqrt{2}$$

$$L.R. = 4a = 2\sqrt{2}$$

Q Find EOP whose vertex $(1, 2)$

& Focus $(5, 2)$ is?



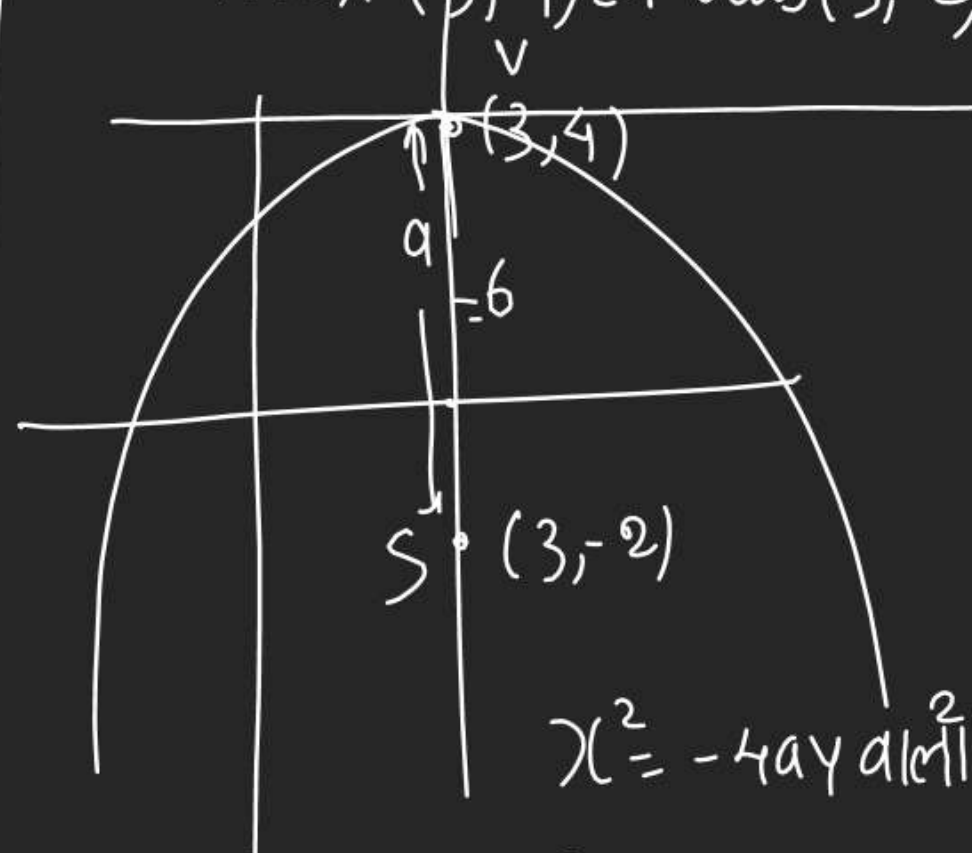
$y^2 = 4ax$ dir profile

$$(y-2)^2 = 4 \times 4(x-1)$$

$$(y-2)^2 = 16(x-1)$$

Q Find EOP whose

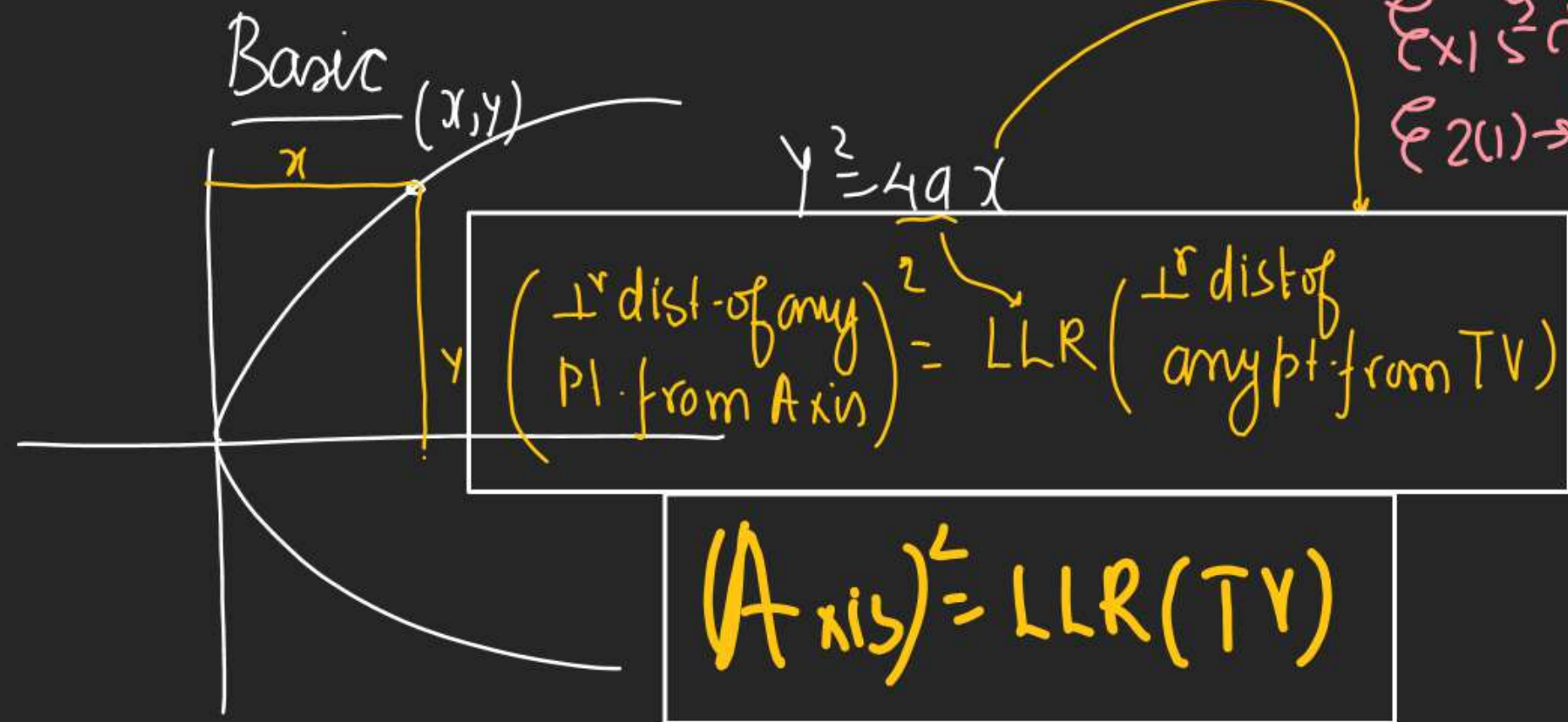
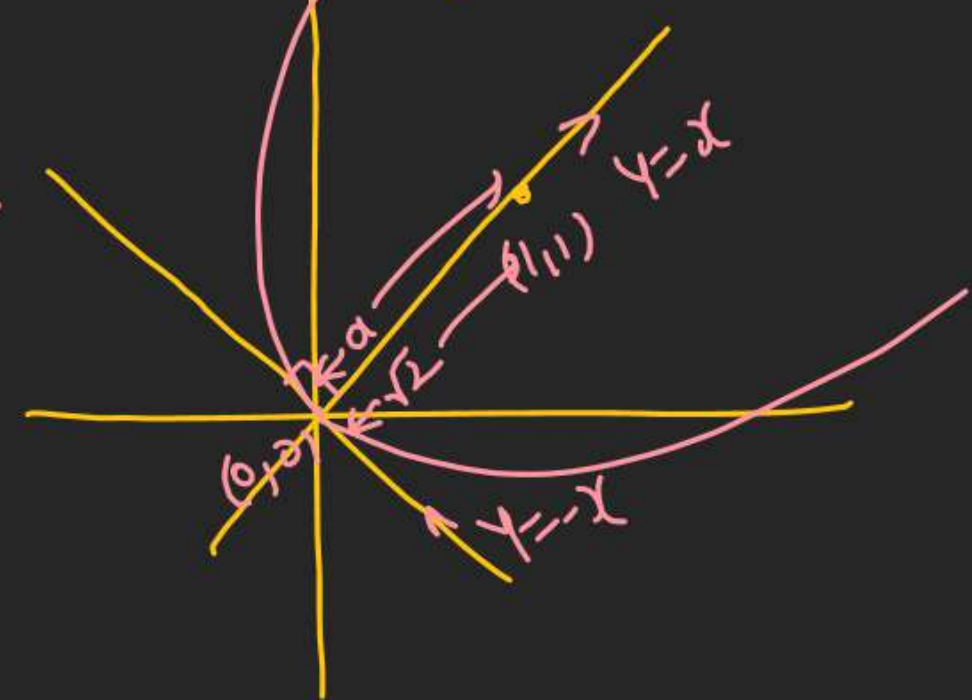
vertex $(3, 4)$ & Focus $(3, -2)$



$x^2 = -4ay$ dir profile

$$(x-3)^2 = -4 \times 6(y-4)$$

$$(x-3)^2 = -24(y-4)$$

5th Profile.TEDA ^{PARABOLA} hai Par bola Mera haiQ Find EOP if $V = (0, 0)$ & $S = (1, 1)$ 

$$\text{Axis} \Rightarrow x - y = 0$$

$$\text{T.V.} \Rightarrow x + y = 0$$

$$\left(\frac{|x - y|}{\sqrt{1^2 + 1^2}} \right)^2 = 4 \sqrt{2} \left(\frac{x + y}{\sqrt{2}} \right)$$

$$(x - y)^2 = 8(x + y)$$