①, ③

$$4 = 1 + \frac{b^2}{\frac{25}{4}}$$

$$4 = \frac{\frac{25}{4} + b^2}{\frac{25}{4}}$$

$$25 = \frac{25}{4} + b^2$$

$$25 - \ldots$$

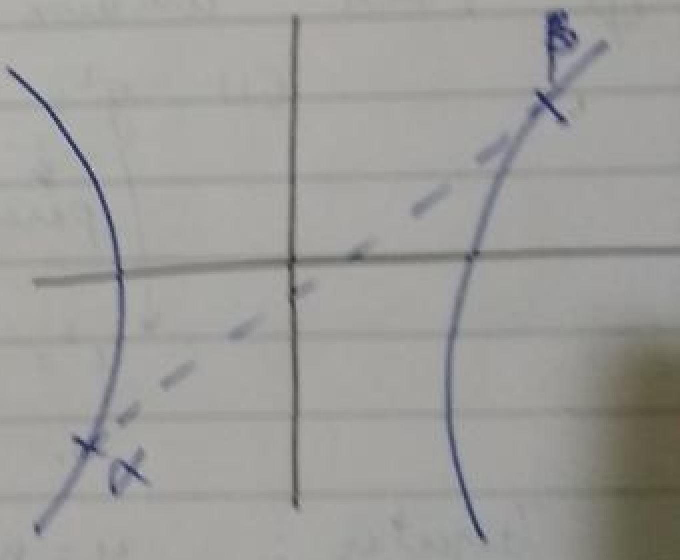
$$\frac{75}{4} = b^2$$

Eqⁿ of Hyperbola

$$\Rightarrow \frac{(x-1)^2}{25/4} - \frac{(y-4)^2}{75/4}$$

EQN OF CHORD AT PT. α AND β

$$\boxed{\frac{x}{a}\cos\left(\frac{\alpha-\beta}{2}\right) - \frac{y}{b}\sin\left(\frac{\alpha+\beta}{2}\right) = \cos\left(\frac{\alpha+\beta}{2}\right)}$$



If CHORD PASSES Through focus.

$$e\cos\left(\frac{\alpha-\beta}{2}\right) = \cos\left(\frac{\alpha+\beta}{2}\right)$$

$$e = \frac{\cos\left(\frac{\alpha+\beta}{2}\right)}{\cos\left(\frac{\alpha-\beta}{2}\right)}$$

So, eq of tangents can be,

$$y = mx \pm \sqrt{a^2m^2 - b^2}$$

$$\Rightarrow \quad y = x \pm \sqrt{\cancel{7}\,\cancel{4}\,1} \longrightarrow y = x \pm 1$$

$$\Rightarrow \quad y = -x \pm \sqrt{\cancel{7}\,1} \longrightarrow y = -x \pm 1$$

we're getting 4 solutions,

$y = x + 1$, $y = x - 1$, $y = -x + 1$, $y = -x - 1$

~~On~~. Solving these eqⁿs with eqⁿ of Hyperbola, we'll find that, are these all real tangent

(5) $D = 0$

(i) $\frac{3x^2}{4} - 4(x+1)^2 = 12$ | find for all case

$D = 0$

CHORD OF CONTACT

$$\boxed{T = 0}$$

EQN. OF CHORD (MID-POINT FORM)

$$\boxed{T = S_1}$$

COMBINED EQ OF TANGENTS

$$\boxed{T^2 = SS_1}$$

EQ. OF RECTANGULAR HYPERBOLA

$$\frac{x^2}{a^2} - \frac{y^2}{a^2} = 1$$

$$\Rightarrow \frac{x^2 - y^2}{a^2} = 1$$

$$\boxed{x^2 - y^2 = a^2}$$

TANGENT

$\sqrt{a^2m^2 - b^2}$ $\Rightarrow$ where $a^2m^2 - b^2 \geq 0$
as it is under root.

$$a^2m^2 - b^2 \geq 0$$

$$(am - b)(am + b) \geq 0$$

$$\left(m - \frac{b}{a}\right)\left(m + \frac{b}{a}\right) \geq 0$$

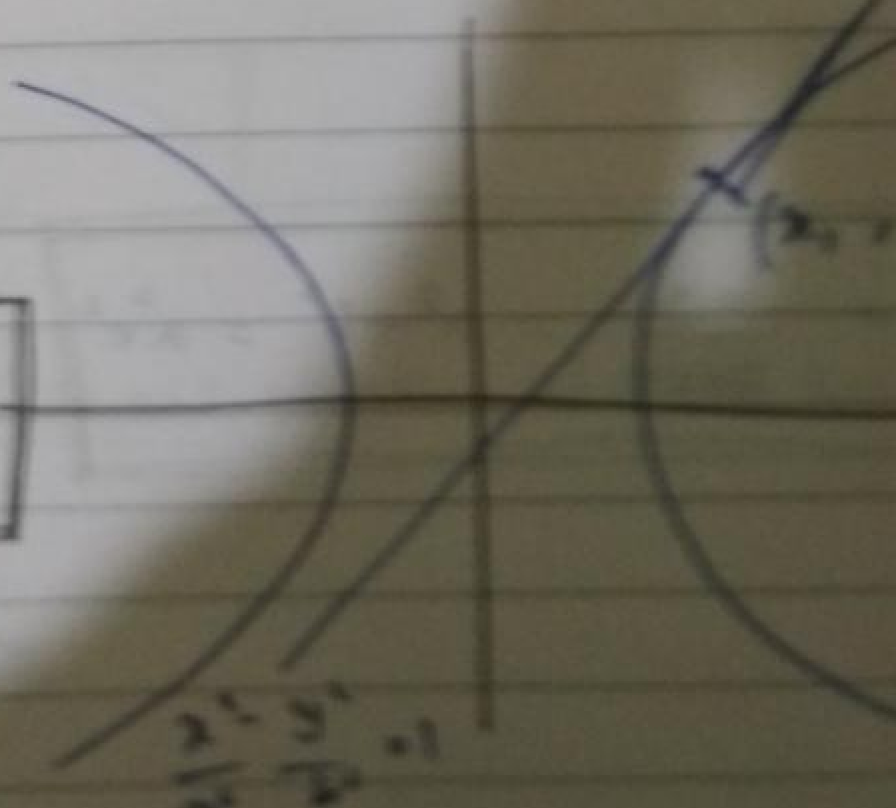
$$m \in \left(-\infty, -\frac{b}{a}\right] \cup \left[b/a, \infty\right)$$

TANGENT (POINT FORM)

POINT FORM

$T = 0$

$$\boxed{\frac{xx_1}{a^2} - \frac{yy_1}{b^2} = 1}$$



PARAMETRIC FORM