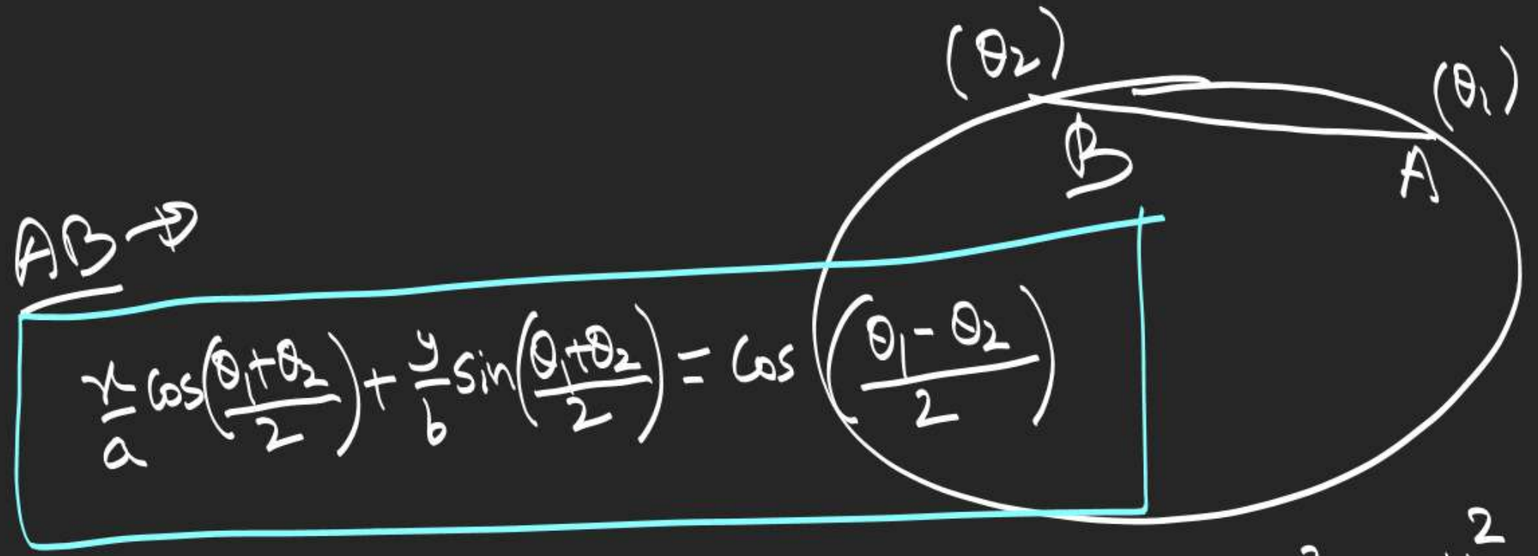
Nishant Jindal

Chord



$$\frac{x}{a}\cos\left(\frac{\theta_1+\theta_2}{2}\right)+\frac{y}{b}\sin\left(\frac{\theta_1+\theta_2}{2}\right)=\cos\left(\frac{\theta_1-\theta_2}{2}\right)$$

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

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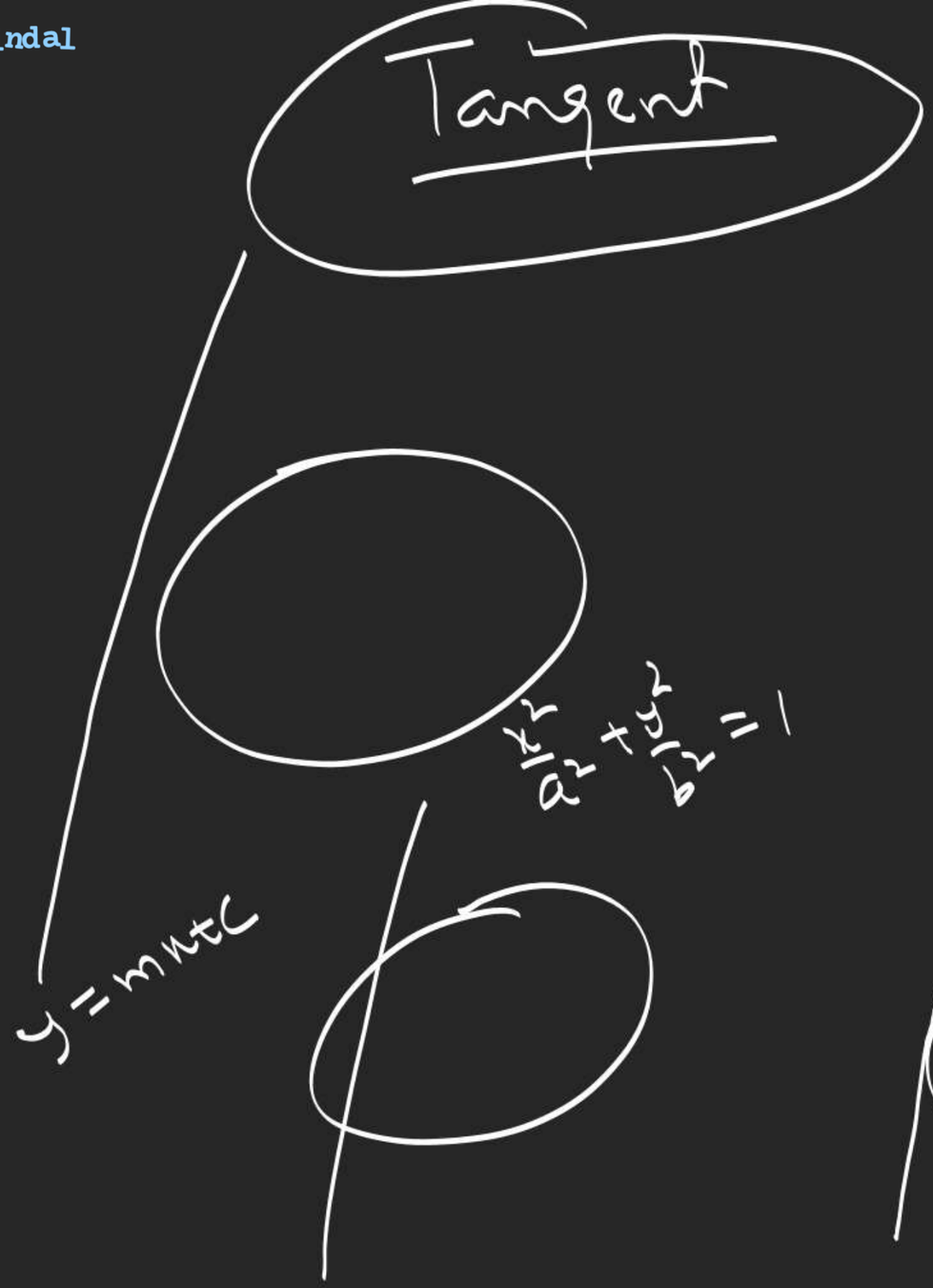
Tangent



$$\frac{x^2}{a^2} + \frac{(mx+c)^2}{b^2} = 1$$

$$(\quad)x^2 + (\quad)x + (\quad) = 0$$

$D > 0 \Rightarrow$ secant

$D = 0 \Rightarrow$ tangent

$D < 0 \Rightarrow$ $\overline{T} \cap \overline{S}$

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Tangent

$\theta_2 = \theta_1 + \pi$

$y = mx \pm \sqrt{a^2m^2 + b^2}$, $m \in R$

$y = mx + c$

(θ_1)

(θ_2)

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

$\frac{x^2}{9} + \frac{y^2}{16} = 1 \rightarrow (3\cos\theta, 4\sin\theta)$

$\frac{x\cos\theta}{a} + \frac{y\sin\theta}{b} = 1$

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

$y = mx \pm \sqrt{9m^2 + 16}$

$\frac{\cos\theta}{-am} = \frac{\sin\theta}{b} = \frac{1}{\pm\sqrt{a^2m^2 + b^2}}$

$\left(\frac{-am}{c}\right)^2 + \left(\frac{b}{c}\right)^2 = 1 \Rightarrow$

$c^2 = m^2a^2 + b^2$

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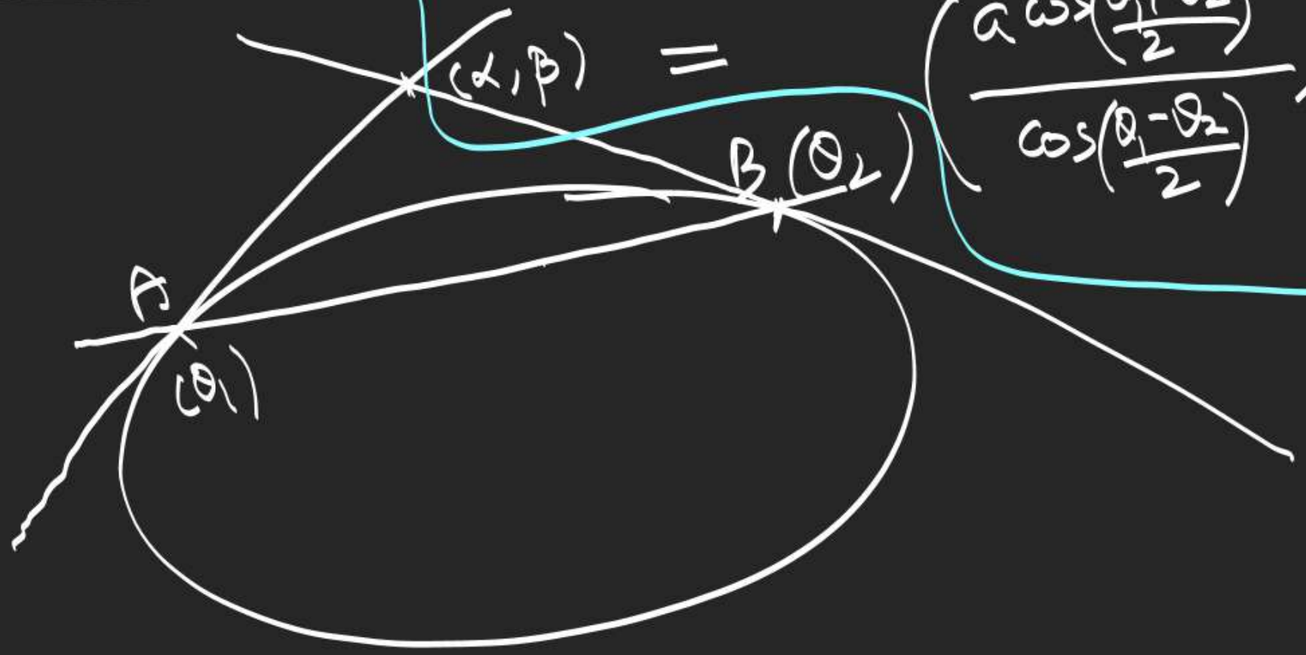
Intersection of 2 two tangents



$$\frac{x\alpha}{a^2} + \frac{y\beta}{b^2} = 1$$

$$\frac{x}{a}\cos\left(\frac{\theta_1+\theta_2}{2}\right) + \frac{y}{b}\sin\left(\frac{\theta_1+\theta_2}{2}\right) = \cos\left(\frac{\theta_1-\theta_2}{2}\right)$$

$$\frac{\alpha}{a\cos\left(\frac{\theta_1+\theta_2}{2}\right)} = \frac{\beta}{b\sin\left(\frac{\theta_1+\theta_2}{2}\right)} = \frac{1}{\cos\left(\frac{\theta_1-\theta_2}{2}\right)}$$

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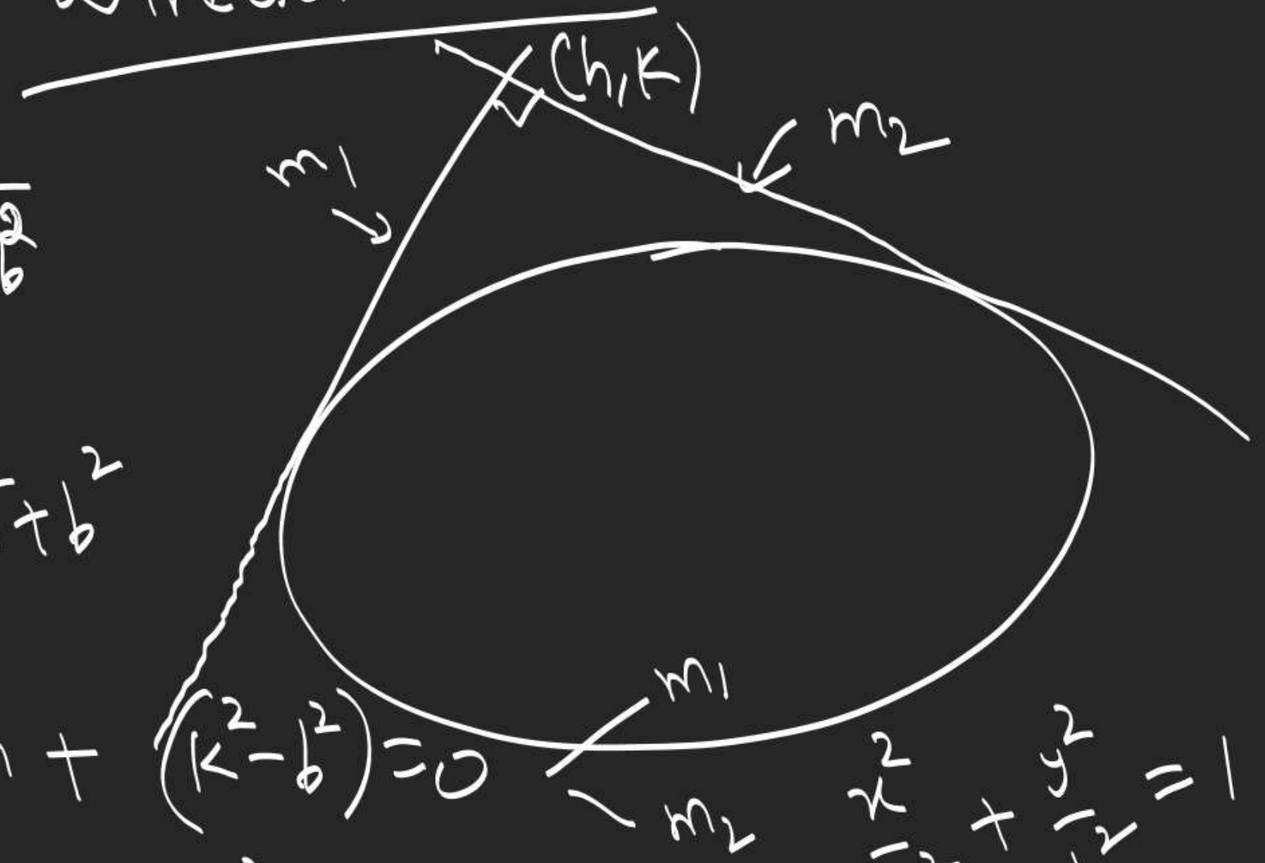
Director Circle



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

Put (h, k)

$$(k - mh)^2 = a^2m^2 + b^2$$

$$m^2(h^2 - a^2) - 2hkm + (k^2 - b^2) = 0$$

$$m_1 m_2 = -1 = \frac{k^2 - b^2}{h^2 - a^2}$$

$$x^2 + y^2 = a^2 + b^2$$

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

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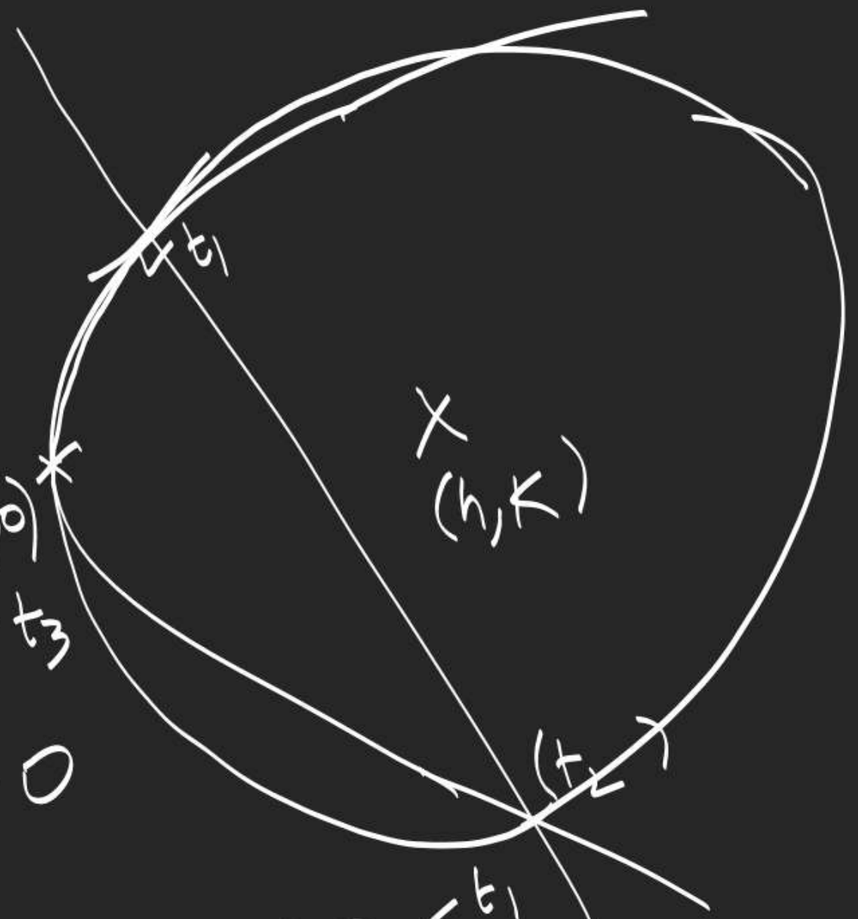

$$t_2 = -t_1 - \frac{2}{t_1}$$

$$t_1 + t_2 = -\frac{2}{t_1} = -t_3$$

$$x^2 + y^2 - 2hx - 2ky = 0$$

$$at^3 + (4a - 2h)t - 4k = 0$$

t_1, t_2, t_3

$$t_1 t_3 = 2$$

$$2t_2 = \frac{4k}{a}$$

$$t_2 = \frac{2k}{a}$$

$$\Sigma x - 3(1-10)$$