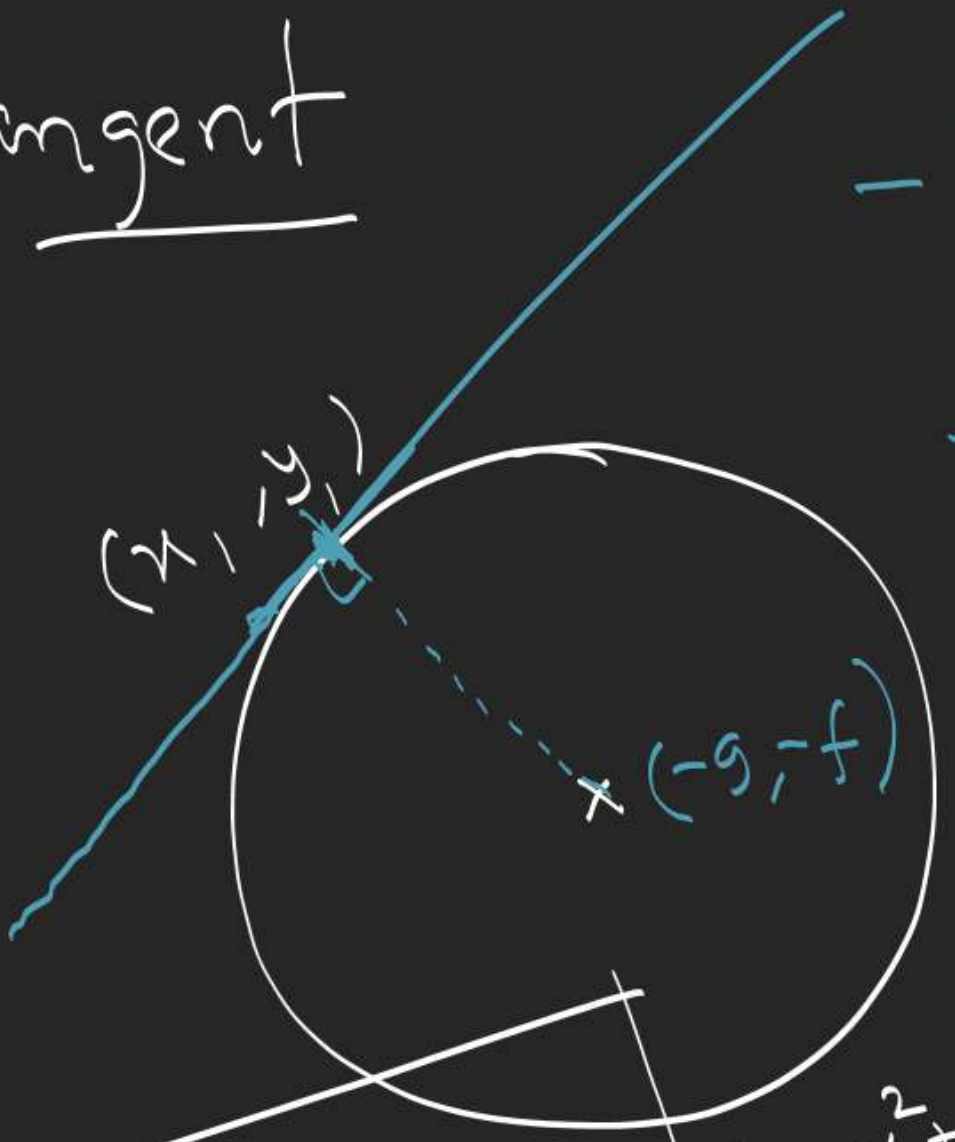
Nishant Jindal

Tangent



$$-\frac{x_1+g}{y_1+f}(x-x_1) = y-y_1$$

$$-xx_1+x_1^2-gx+gx_1 = yy_1-y_1^2+fy-fy_1$$

$$xx_1+yy_1+gx+fy = x_1^2+y_1^2+gx_1+fy_1$$

$$xx_1+yy_1+g(x+x_1)+f(y+y_1)+c = x_1^2+y_1^2+2gx_1+2fy_1+c$$

$ax^2+by^2+2hxy+2gx+2fy+c=0$

$x^2 \to xx_1$

$y^2 \to yy_1$

$x \to \frac{x+x_1}{2}$

$y \to \frac{y+y_1}{2}$

$xy \to \frac{xy_1+yx_1}{2}$

$c \to c$

$S = x^2+y^2+2gx+2fy+c=0$ ✓

$$\boxed{xx_1+yy_1+g(x+x_1)+f(y+y_1)+c=0}$$

$= T$.

$$\boxed{T=0}$$

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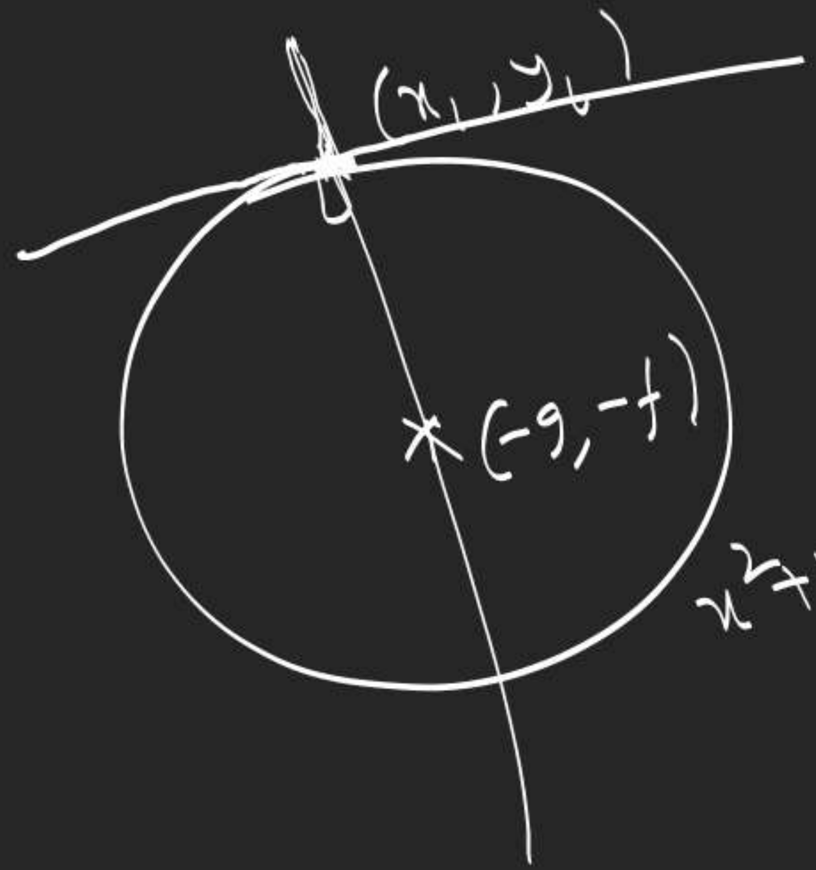
Normal



$$x^2+y^2+2gx+2fy+c=0$$

$$y-y_1=\left(\frac{y_1+f}{x_1+g}\right)(x-x_1)$$

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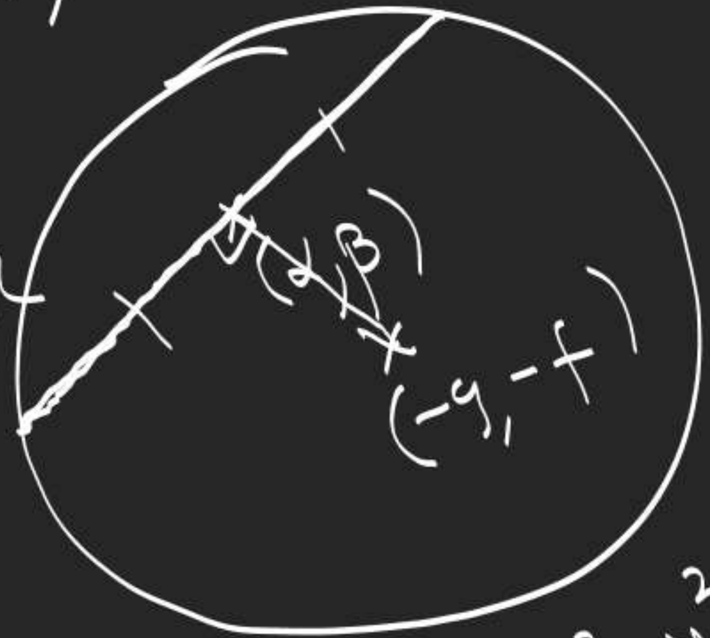
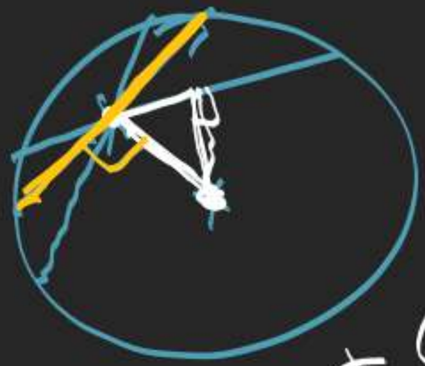
Chord whose midpoint is given / Chord passing thru (α,β) situated at max. distance from centre / Shortest chord thru (α,β)

$$y-\beta = -\left(\frac{\alpha+g}{\beta+f}\right)(x-\alpha)$$

$$y\beta-\beta^2+fy-\beta f = -\alpha x+\alpha^2-gx+g\alpha$$



$$x^2+y^2+2gx+2fy+c=0$$



$$\alpha x+\beta y+gx+fy = \alpha^2+\beta^2+g\alpha+f\beta$$

$$\alpha x+\beta y+g(x+\alpha)+f(y+\beta)+c = \alpha^2+\beta^2+2g\alpha+2f\beta+c$$

$$\boxed{T=S_1}$$

$$2\sqrt{r^2-p^2}=L$$

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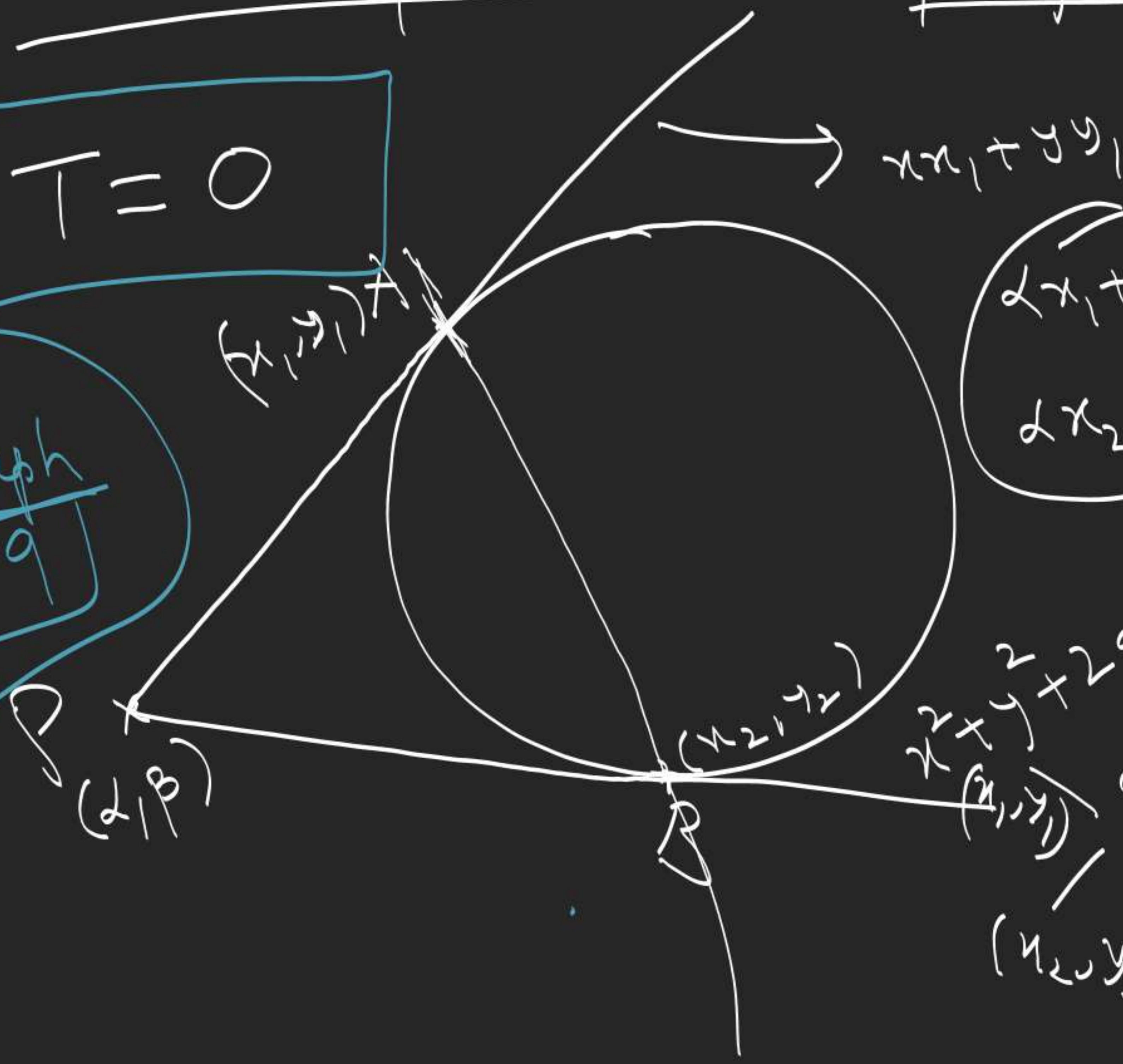
Chord of Contact of a point w.r.t Circle

$$\boxed{T=0}$$

Paragraph

$\boxed{1 \text{ to } 9}$

{2,6}



$$xx_1+yy_1+g(x+x_1)+f(y+y_1)+c=0$$

$$\alpha x_1+\beta y_1+g(\alpha+x_1)+f(\beta+y_1)+c=0$$

$$\alpha x_2+\beta y_2+g(\alpha+x_2)+f(\beta+y_2)+c=0$$

$$x^2+y^2+2gx+2fy+c=0$$

(x_1,y_1)

(x_2,y_2)

$$\alpha x+\beta y+g(\alpha+x)+f(\beta+y)+c=0$$

Chord of Contact