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Circle

real circle $\rightarrow g^2+f^2-c > 0$

point circle $\rightarrow g^2+f^2-c=0$ or

Imaginary circle $\rightarrow g^2+f^2-c<0$

(x,y)

(α,β)

$$\boxed{(x-\alpha)^2+(y-\beta)^2=r^2} \rightarrow \text{circle}$$

Centre $=(\alpha,\beta)$

radius $=r$

$$x^2+y^2-2\alpha x-2\beta y+\alpha^2+\beta^2-r^2=0$$

$$\boxed{\begin{aligned}\text{radius} &= \sqrt{g^2+f^2-c}\\ \text{Centre} &= (-g,-f)\end{aligned}}$$

General form $\rightarrow$ $\boxed{x^2+y^2+2gx+2fy+c=0}$

$g=-\alpha$, $f=-\beta$, $c=\alpha^2+\beta^2-r^2$

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Condition for two degree curve
$ax^2+by^2+2hxy+2gx+2fy+c=0$ to represent circle

$h=0$

$a=b$

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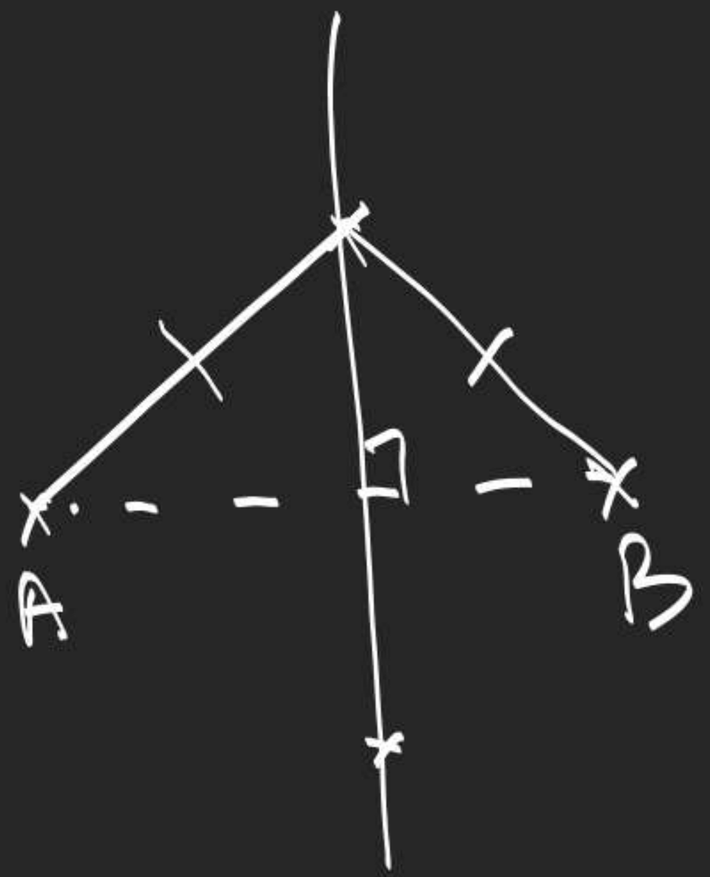

A, B → fixed points

Find locus of point 'P'

s.t. $\dfrac{PA}{PB} = \text{constant} = \lambda, \ \lambda > 0$

If $\lambda = 1 \rightarrow \perp$ ar bisector of AB

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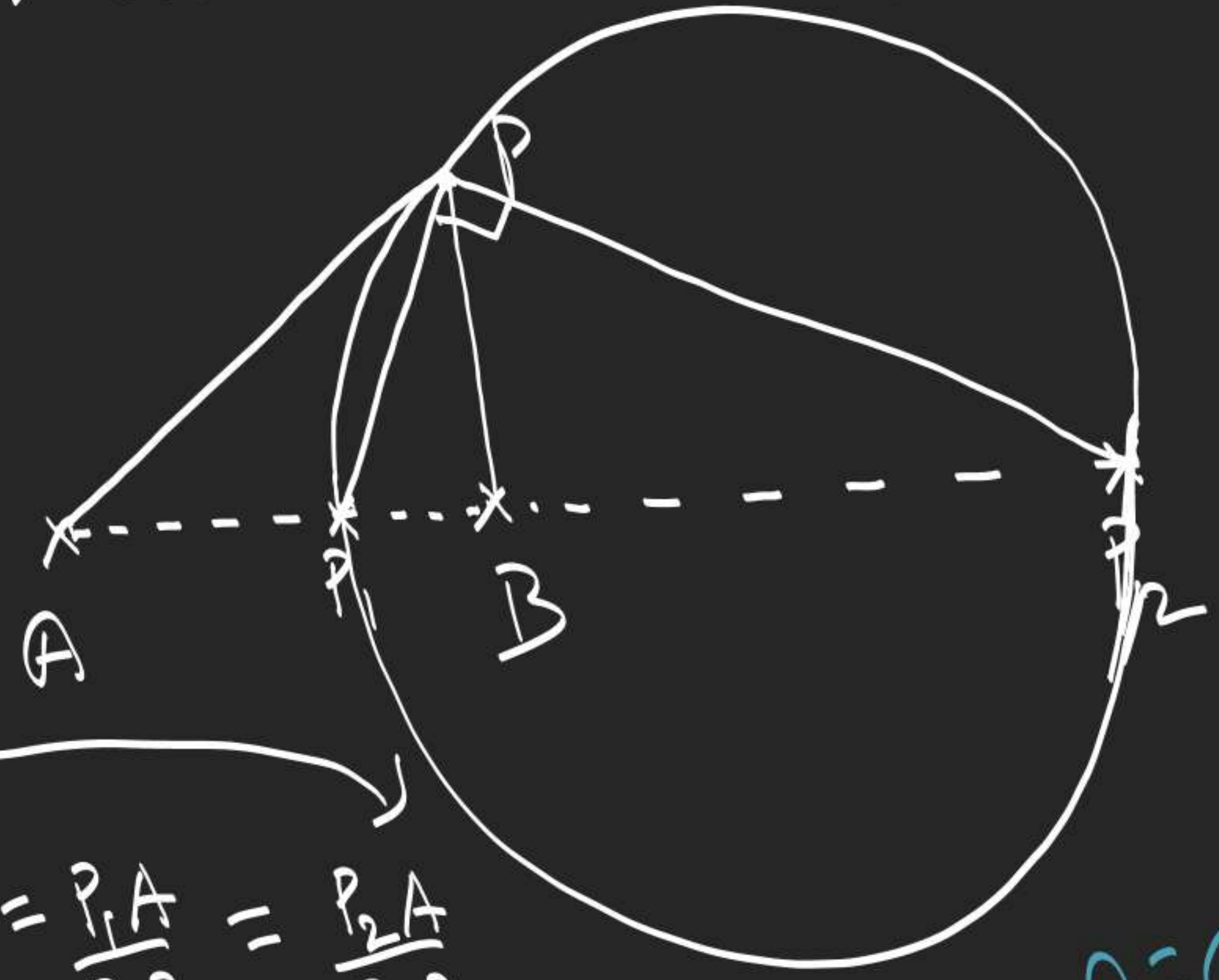
$\lambda > 0,\ \lambda \neq 1 \rightarrow$ Circle with P_1, P_2 as diameter.



$\frac{PA}{PB} = \lambda$

Ex - $\boxed{1-13}$

$$\frac{PA}{PB} = \lambda = \frac{P_1A}{P_1B} = \frac{P_2A}{P_2B}$$

$A = (-a, 0)\ ,\ B = (a, 0)$

$$(x+a)^2 + y^2 = \lambda^2\left((x-a)^2 + y^2\right)$$

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