

Find the locus of the ...

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Solution: -

Intersection point of

$ax + by + c = 0$ — (i) $\times d$

$dx + my + n = 0$ — (ii) $\times a$

~~$adx + bdy + cd = 0$~~

~~$adx + amy + an = 0$~~

$bdy - amy + cd - an = 0$

$y(bd - am) = an - cd$

$y = \frac{an - cd}{bd - am}$ *

Again,

(i) $\times m$

(ii) $\times b$

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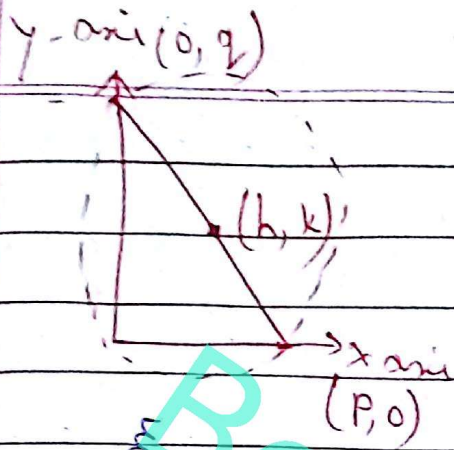
~~$amx + bmy + cm = 0$~~

~~$bdx + bmy + bn = 0$~~

~~$amx - bdx + cm - bn = 0$~~

~~$x(am - bd) = bn - cm$~~

$x = \frac{bn - cm}{am - bd}$ *



Since it is forming a right triangle. So, circumcentre will lie on the midpoint of hypotenuse (h,k).

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Any Intercept form: =

$$\frac{x}{p} + \frac{y}{q} = 1$$

$$\frac{x}{2h} + \frac{y}{2k} = 1$$

$$\frac{x}{h} + \frac{y}{k} = 2 \quad *$$

Putting value of x and y,

$$\frac{(bn - cm)}{(am - bl)} + \frac{y (am - cl)}{bl - cm} = 2$$

$$\Rightarrow \frac{k (bn - cm) (bl - cm) + h (am - cl) (am - bl)}{h k (am - bl) (bl - cm)} = 2$$

$$\Rightarrow k (bn - cm) (bl - cm) + h (am - cl) (am - bl) = 2 h k (am - bl) (bl - cm)$$

⇒ Replace h by x and k by y.

Ans

$$y (bn - cm) (bl - cm) + x (am - cl) (am - bl) = 2xy (am - bl) (bl - cm)$$