Nishant Jindal

Ellipse

(1) If 2nd deg Eqn

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

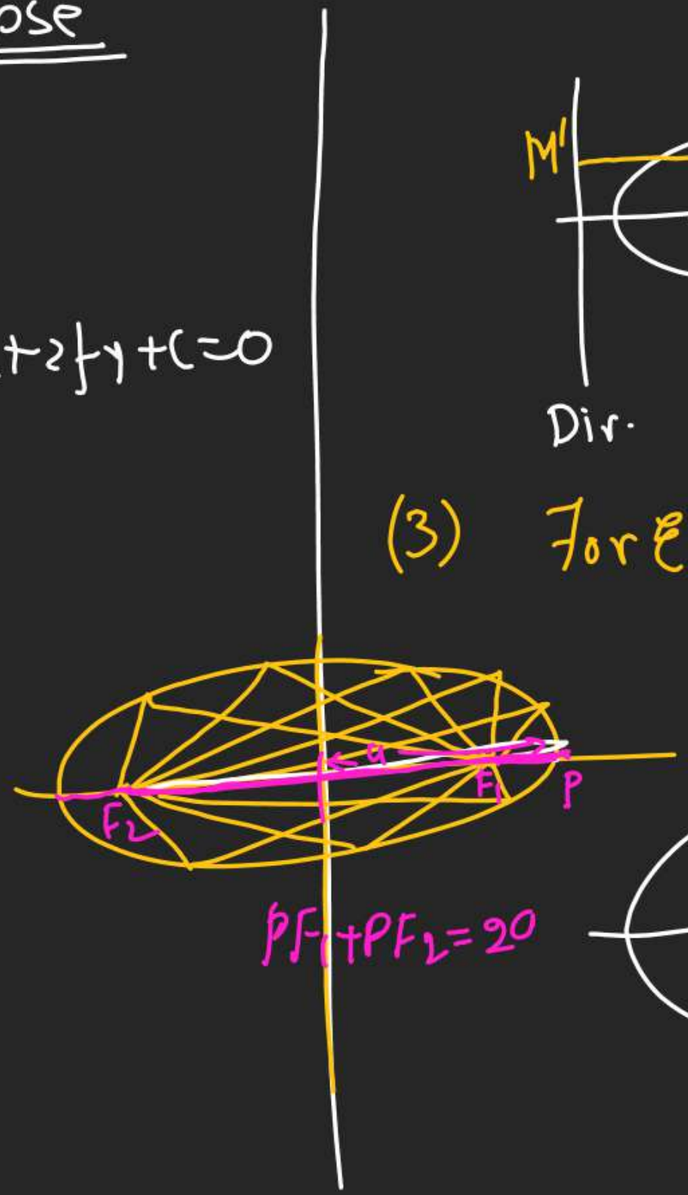
A) $\Delta \neq 0$

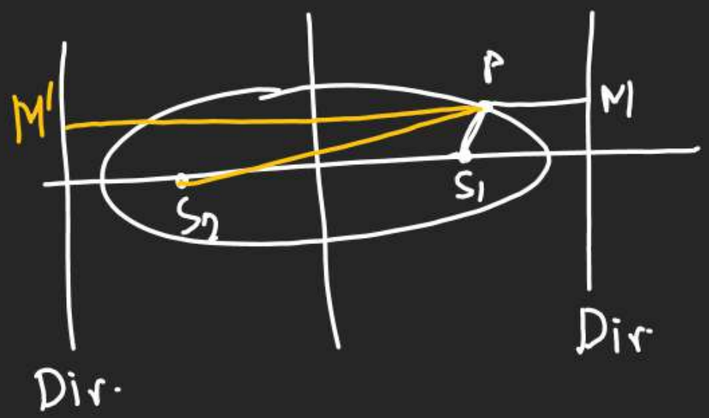
B) $h^2<ab$

(2) By Eccentricity

$$e=\frac{SP}{PM}<1$$

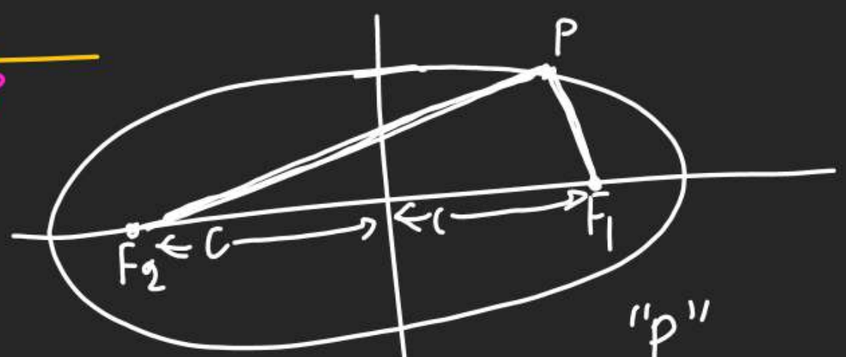
$$SP<PM$$





(3) For Ellipse Required cond^n is

$PF_1+PF_2=2a$ & $2a>2c$



Ellipse is locus of a Pt "P" such that $\forall$ sum of distance from 2 fixed Pts (F_1F_2) Remains Constant

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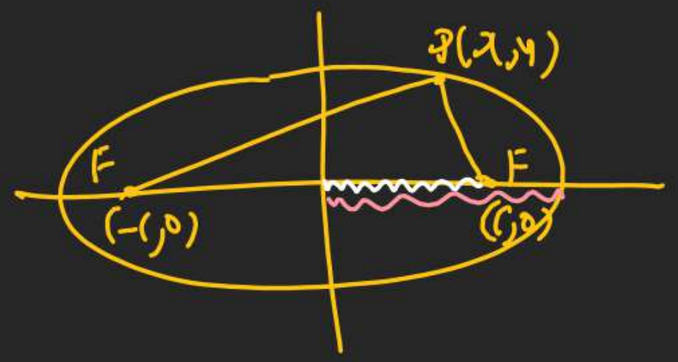
(5)



$PF_1 + PF_2 = 2a$

$\sqrt{(x-c)^2+y^2} + \sqrt{(x+c)^2+y^2} = 2a$

After Solving

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

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

RK $\Rightarrow$ $a^2 - c^2 = b^2$

$c^2 = a^2 - b^2$

$2a > 2c$

$\Rightarrow a > c$

$\Rightarrow a^2 > c^2$

$\Rightarrow a^2 - c^2 > 0$

$a^2 - c^2$ will be a +ve No

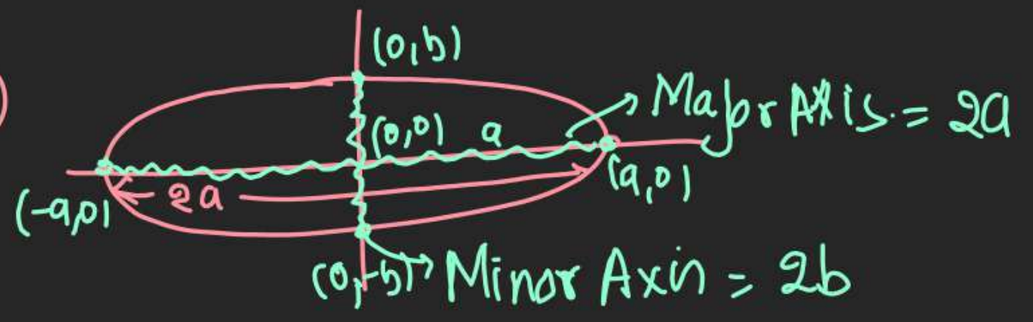
any +ve No. can be sqr of some No.

(6) Eccentricity

1st day Learning

$$e = \frac{c}{a} = \frac{\text{dist. of Focus from centre}}{\text{dist of vertex from centre}}$$

(7)



(8) do we know $e = \frac{c}{a}$

$\Rightarrow e^2 = \frac{c^2}{a^2}$ $\Rightarrow 1 - e^2 = 1 - \frac{c^2}{a^2}$

$= \frac{a^2 - c^2}{a^2}$

$1 - e^2 = \frac{b^2}{a^2}$

or

$b^2 = a^2(1-e^2)$