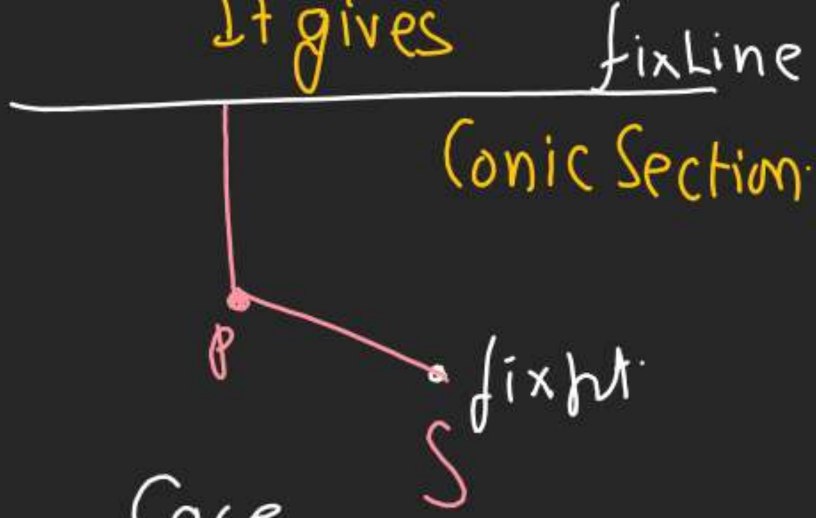
Nishant Jindal

When fix pt is not on fix Line

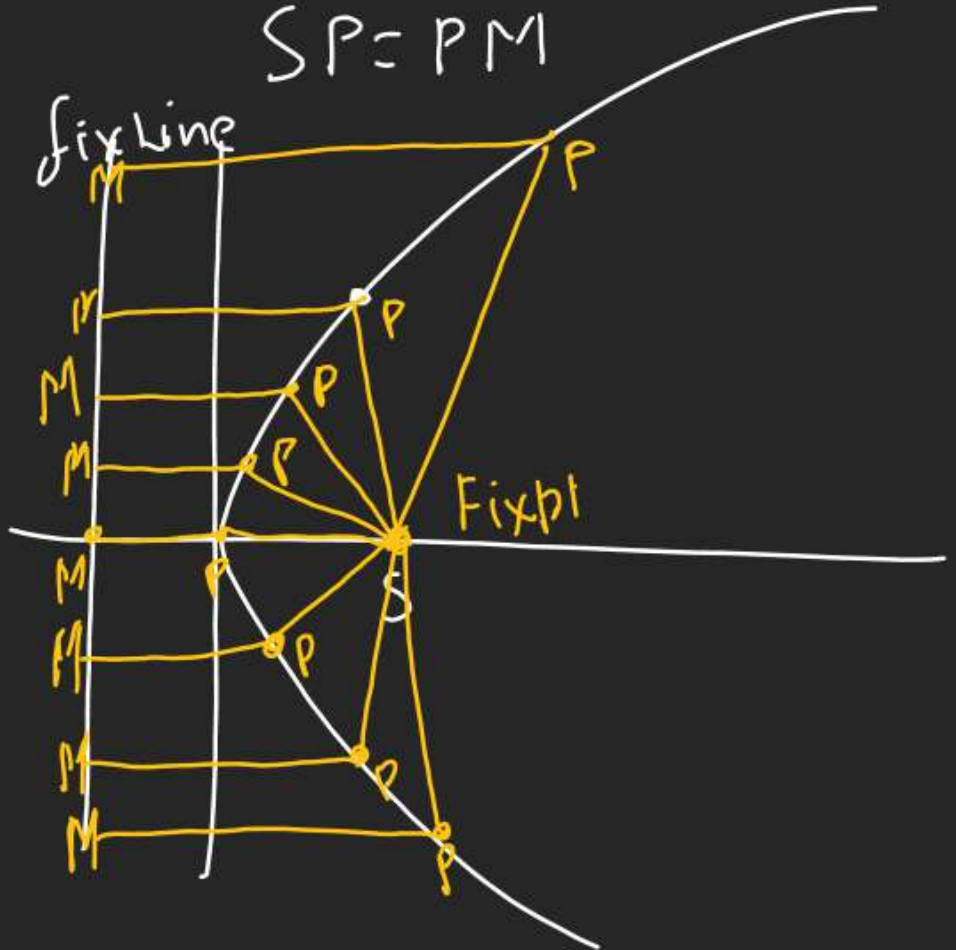
It gives Conic Section

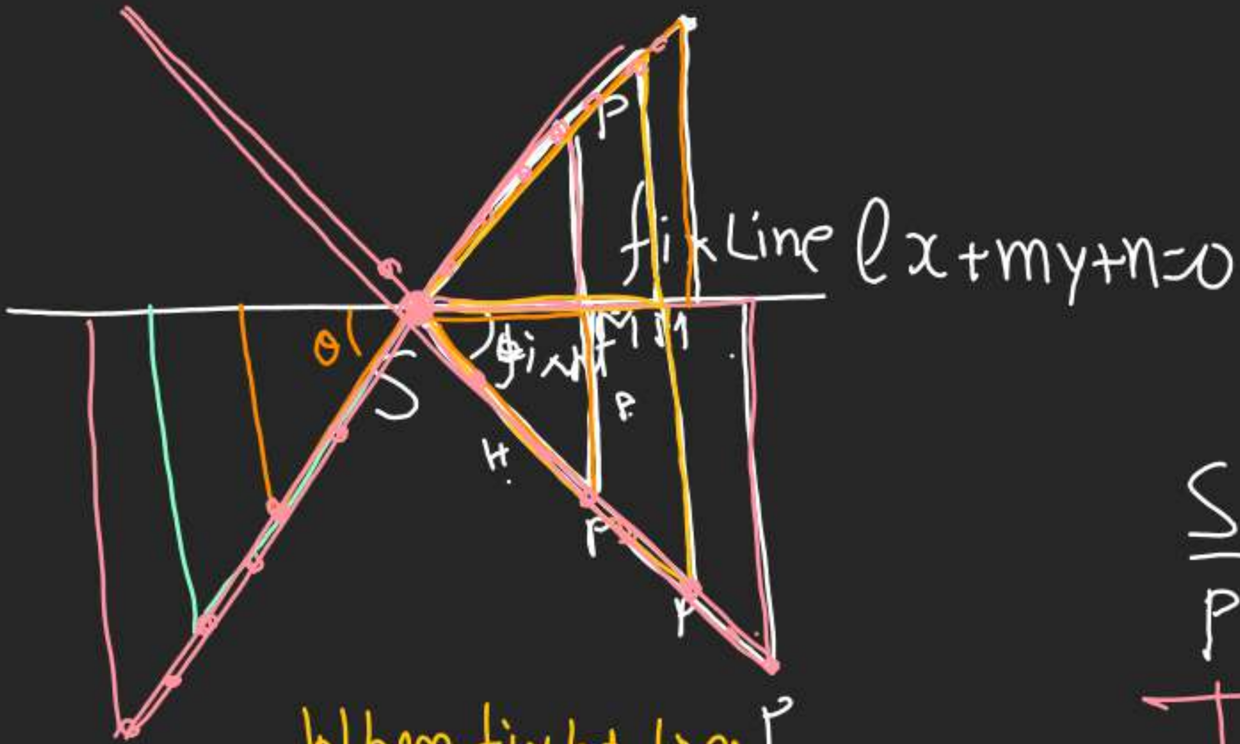


Case

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

$SP = PM$





When fixpt lies on fixLine Locus of P is Pair of St. Line

$\frac{SP}{PM} = K = 1.2$ [let]

Locus of P will be Pair of St. Line

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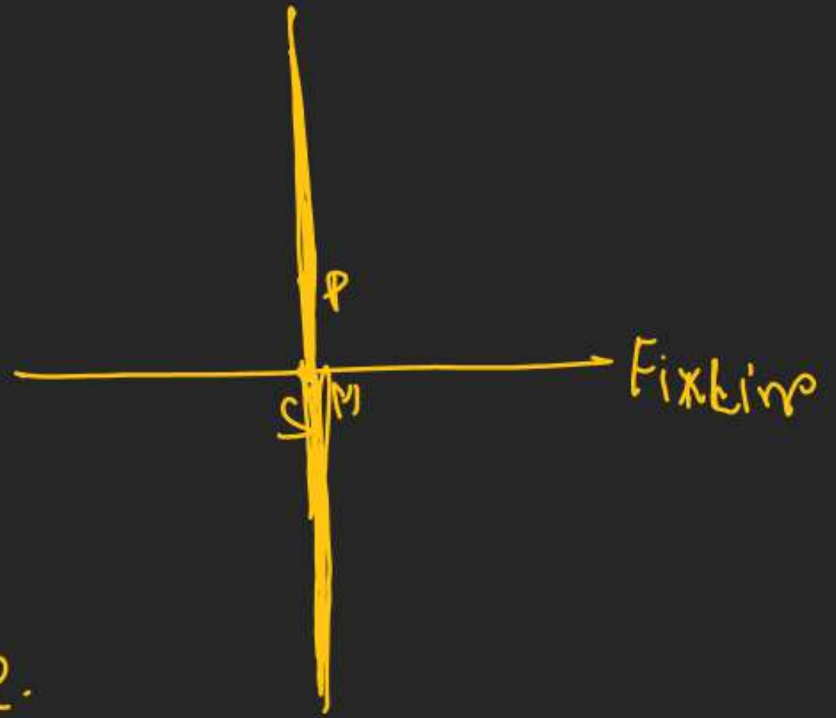
eccentricity = e

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



Yad

When fix pt. lies on Fix Line

$e < 1$	No Real Line
$e = 1$	Coincident Line
$e > 1$	Normal Pair of st. Line
$e \to \infty$	Parallel Line

When fix pt is not on Line.

$e < 1$	Ellipse
$e = 1$	Parabola
$e > 1$	hyperbola
$e = 0$	Circle.

100 — 12000

Seeing Conic Section from Non Hom. 2^{nd} Deg Eqn.

Non Hom 2^{nd} Deg Eqn.

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

2) It Rep. Pair of St. line as well as Conic for that we calculate Δ

(3) $\Delta = \left|\begin{matrix} a & h & g \\ h & b & f \\ g & f & c \end{matrix}\right| \begin{matrix} a & h \\ h & b \\ g & f \end{matrix}$

$\Delta = (abc+2fgh) - bg^2 - af^2 - ch^2$

(4) If $\Delta = 0$ then Non Hom Eqn Rep. Pair of St. Line.

(5) If $\Delta \neq 0$ then Non Hom Eqn Rep. Conic Section.

$\Delta = 0$ Degenerated Conic	$\Delta \neq 0$ Non Degenerated Conic
Pt.	Parabola
St. Line	Ellipse
Pair of St. Line	hyperbola
	Circle

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(6)

$\Delta = 0$		$\Delta \neq 0$	
$h^2 > ab$	Distinct Pair of St. Line	$h^2 > ab$	hyperbola
$h^2 = ab$	Coincide Pair of STL	$h^2 = ab$	Parabola
$h^2 < ab$	pt.	$h^2 < ab$	Ellipse

$h = 0,\ a = b$. Circle

$ax^2 + by^2 + \cancel{2hxy} + 2gx + 2fy + c = 0$

Q find value of K for which

$\boxed{6x^2 + 11xy - 10y^2 + x + 31y + K = 0}$

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

rep. Pair of STL.

$\Delta = 0$ hoga.

$abc + 2fgh - af^2 - bg^2 - ch^2 = 0$

$6 \times -10 \times K + 31 \times \frac{1}{2} \times \frac{11}{2} - 6 \times \left(\frac{31}{2}\right)^2 + 10 \times \frac{1}{4} - \frac{K \times 121}{4} = 0$

$\Rightarrow K\left(\frac{121}{4} + 60\right) = \left(\frac{31 \times 11}{4} - \frac{6 \times 961}{4}\right) + \frac{10}{4}$

$K\left(\frac{361}{4}\right) = \frac{31}{4}(11 - 186) + \frac{10}{4}$

$K(361)/\cancel{4} = \frac{31 \times -175 + 10}{\cancel{4}} \Rightarrow K = -15$

$$\begin{array}{r} 175 \\ \times\ 31 \\ \hline 175 \\ 525 \\ \hline 5425 \\ 361 \end{array} \qquad \begin{array}{r} 3610 \\ 1805 \\ \hline 5415 \end{array}$$

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Q Find Nature of

$$x^2-2xy+y^2+3x+2=0$$

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

$a=1,\ h=-1\ |\ b=1\ |\ 2g=3\ |\ f=0\ |\ c=2$

① $\Delta = abc+2fgh-af^2-bg^2-ch^2$

$= 1\times 1\times 2+2\times 0-1\times 0-1\times \frac{9}{4}-2\times(-1)^2$

$= -2-\frac{9}{4}-2 \neq 0$ (C.S.)

(2) $h^2=(-1)^2=1$

$ab=1\times 1=1$

$\Bigg\}\ h^2=ab$

Parabola

Q What conic does

$\sqrt{ax}+\sqrt{by}=1$ Rep?

$ax+by+2\sqrt{abxy}=1$

$(ax+by-1)^2=(2\sqrt{abxy})^2$

$a^2x^2+b^2y^2+1+2abxy-2by-2ax=4abxy$

$\boxed{a^2}x^2+\boxed{b^2}y^2-2abxy-2ax-2by+1=0$

$\boxed{A}x^2+\boxed{B}y^2+2Hxy+2Gx+2Fy+1=0$

$H^2=(-ab)^2=a^2b^2$

$A\cdot B=a^2\times b^2$

$H^2=AB \Rightarrow$ It is a Parabola