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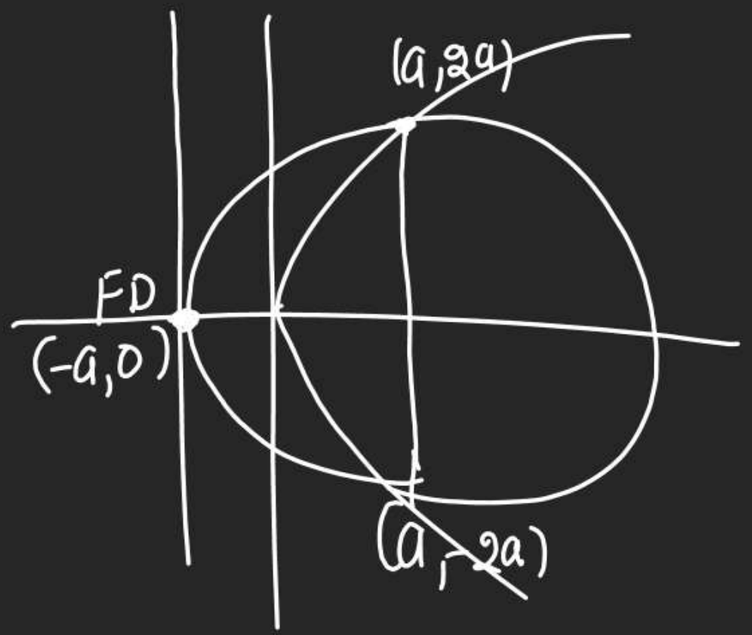
(7) Circle taking L.R. as diameter always touches F.D.



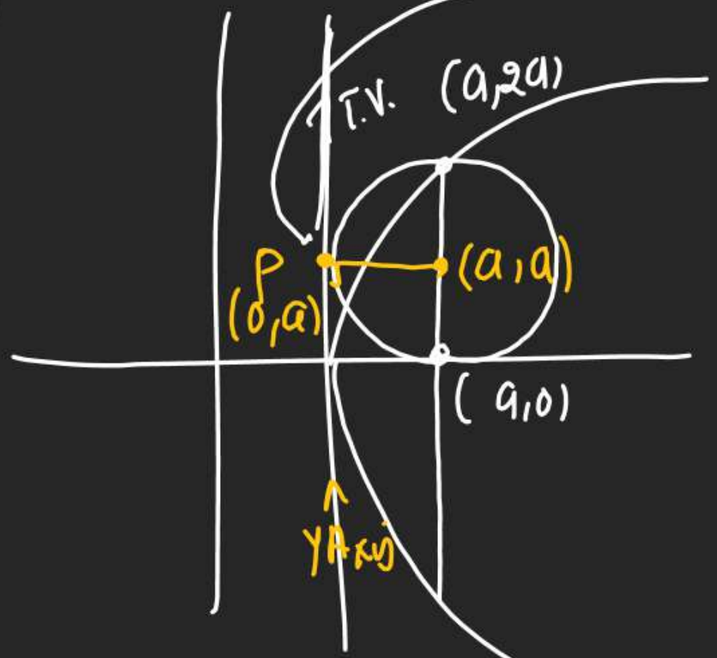
$(x-a)(x-a)+(y-2a)(y+2a)=0$

$(-a,0) \rightarrow (-2a)(-2a)+(-2a)(+2a)=0$

$4a^2+(-4a^2)=0$

$0=0$ Satisfied

(8) Circle taking SemiLR as Diameter touches T.r.



Circle $\rightarrow (x-a)(x-a)+(y-2a)(y-0)=0$

$(0,a) \rightarrow (0-a)(0-a)+(a-2a)(a)$

$a^2+-a^2=0$

$0=0$

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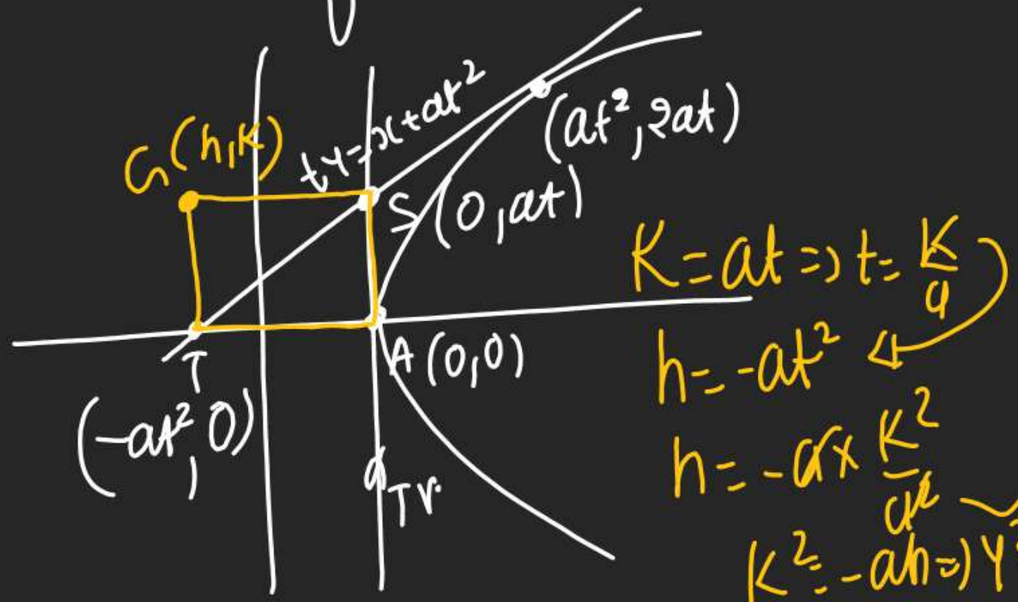
Q Tangent at any pt of $Y^2=4ax$ meet axis at T & T.V. at S

Where A = Vertex of Parabola.

If TASG is a Rectangle find. LOCUS of "G"?



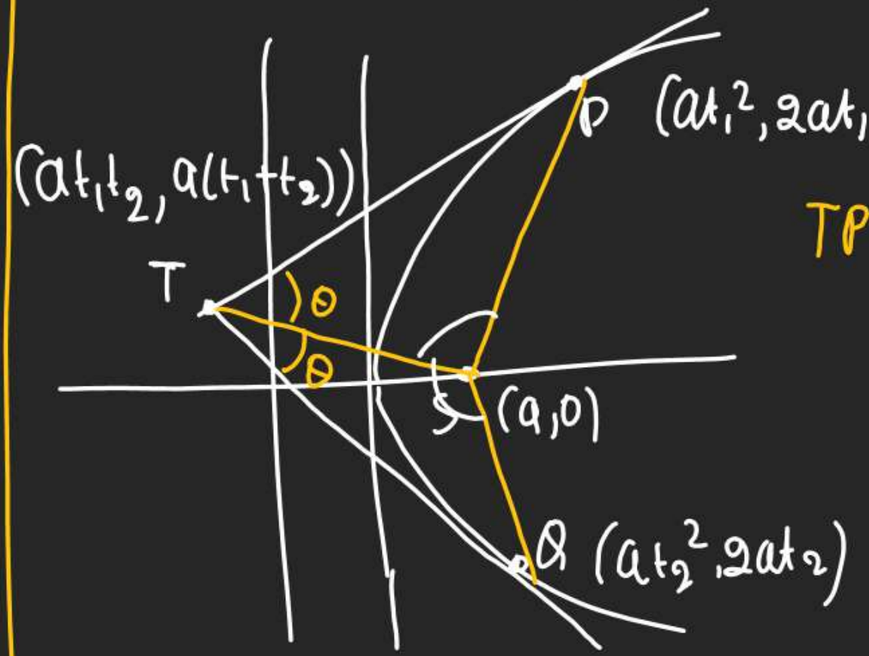
$K=at \Rightarrow t=\frac{K}{a}$

$h=-at^2$

$h=-ax\frac{K^2}{a^2}$

$K^2=-ah \Rightarrow Y^2=-aX$

(9) If tangents drawn from 2 pts P & Q meets at T then



TP = TQ & TS (common Side)

$\Delta STP \sim \Delta STQ$

$ST^2 = SP \cdot SQ$

$\frac{SP}{ST} = \frac{ST}{SQ}$

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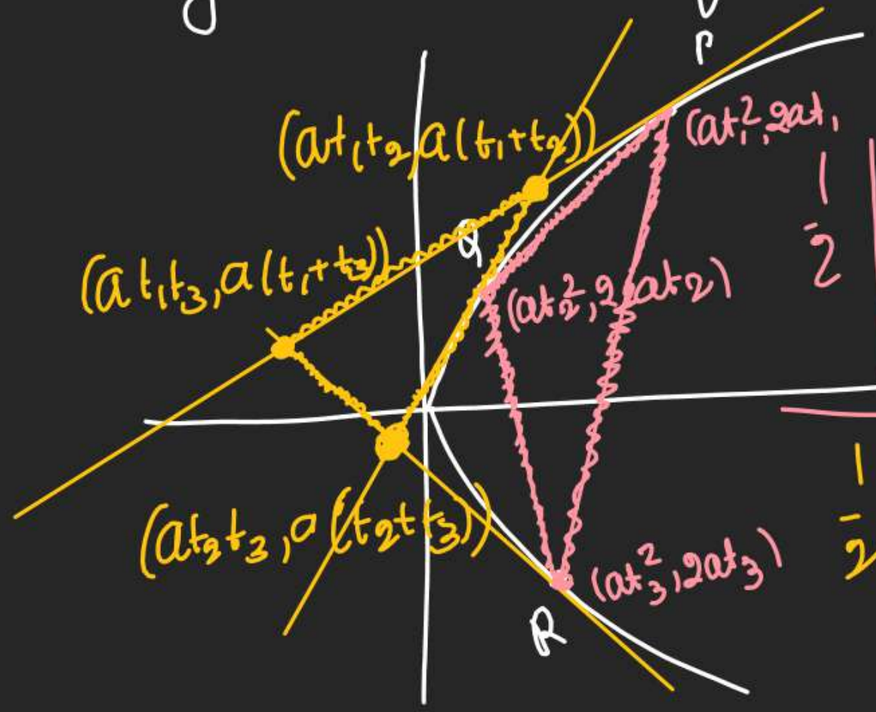
(10) Area of Δ drawn from 3 pt of Parabola is double of area of Δ drawn from tangents at that pts of Parabola.

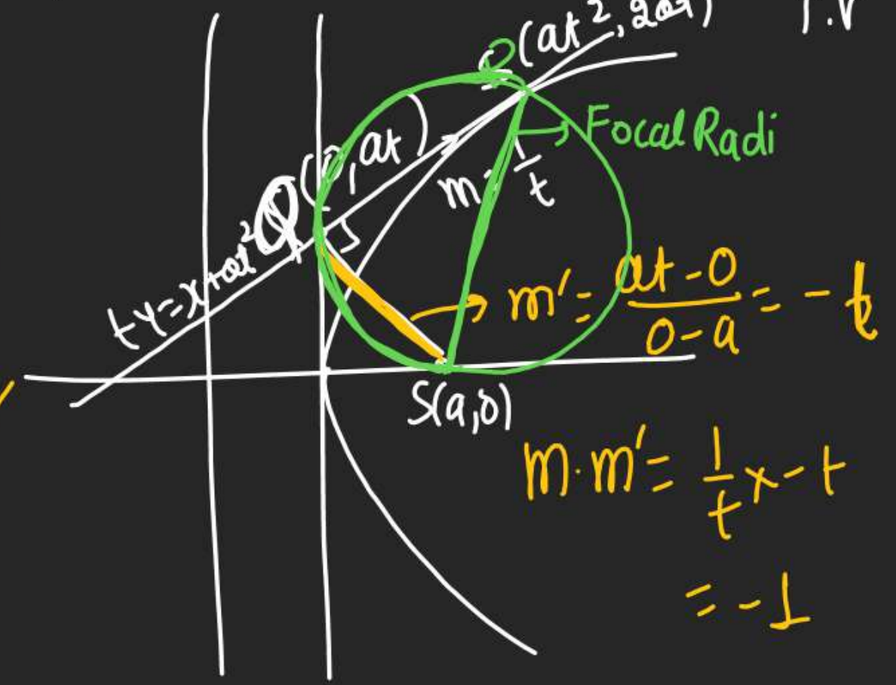


$$\frac{1}{2}\begin{vmatrix} at_1^2 & 2at_1 & 1 \\ at_2^2 & 2at_2 & 1 \\ at_3^2 & 2at_3 & 1 \end{vmatrix}$$

$$\frac{1}{2}\begin{vmatrix} at_1t_2 & a(t_1+t_2) & 1 \\ at_2t_3 & a(t_2+t_3) & 1 \\ at_3t_1 & a(t_3+t_1) & 1 \end{vmatrix}$$

$=$

(11) Foot of $\perp^r$ drawn from focus upon any tangent lies on T.V. Hence Circle described on any focal Radii as diameter touches



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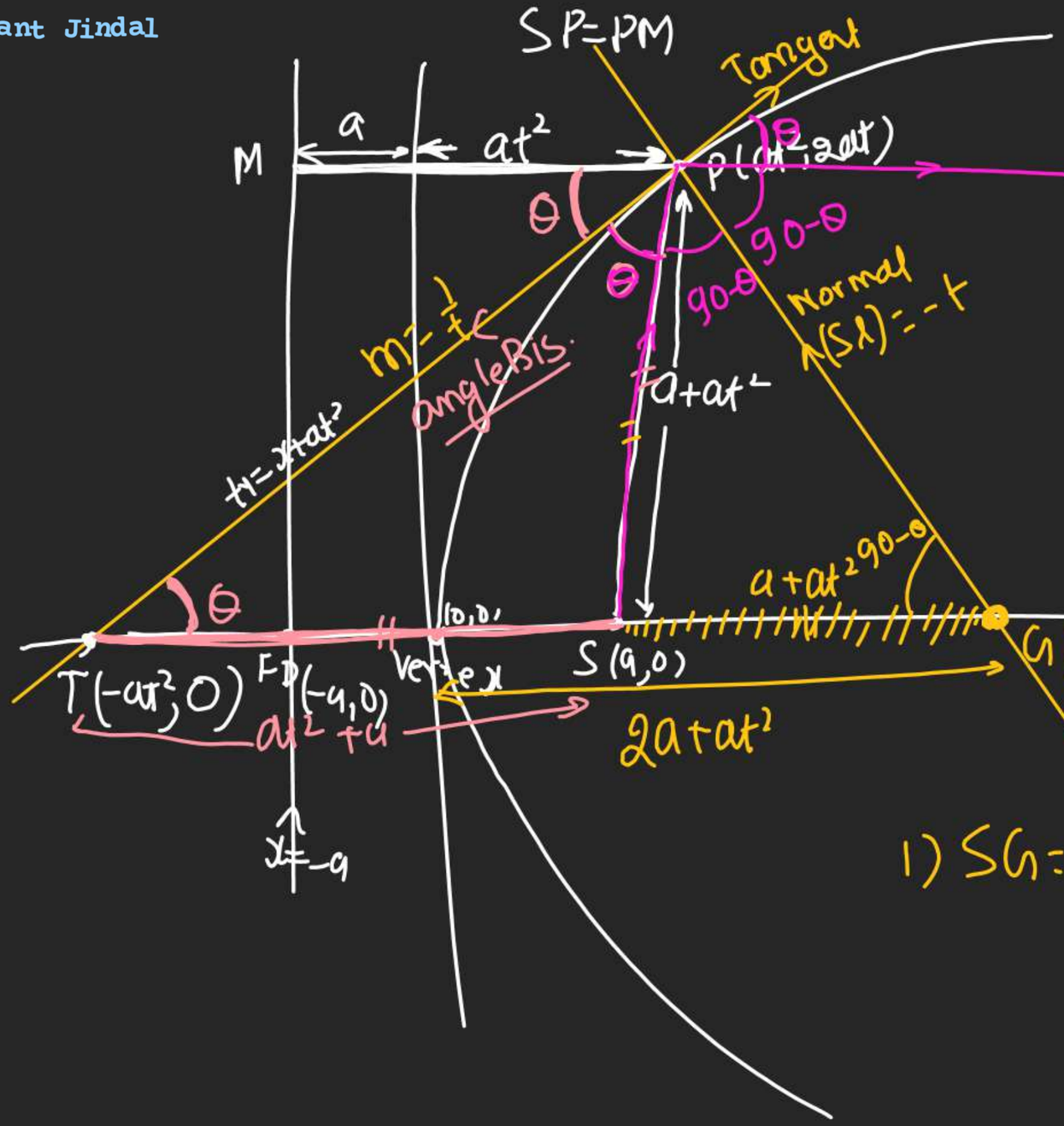

EQN

$(Y - 2at) = -t(x - at^2)$

$Y - 2at = -tx + at^3$

$\boxed{Y + tx = 2at + at^3}$

1) $SG = SP = PM = TS = a + at^2$

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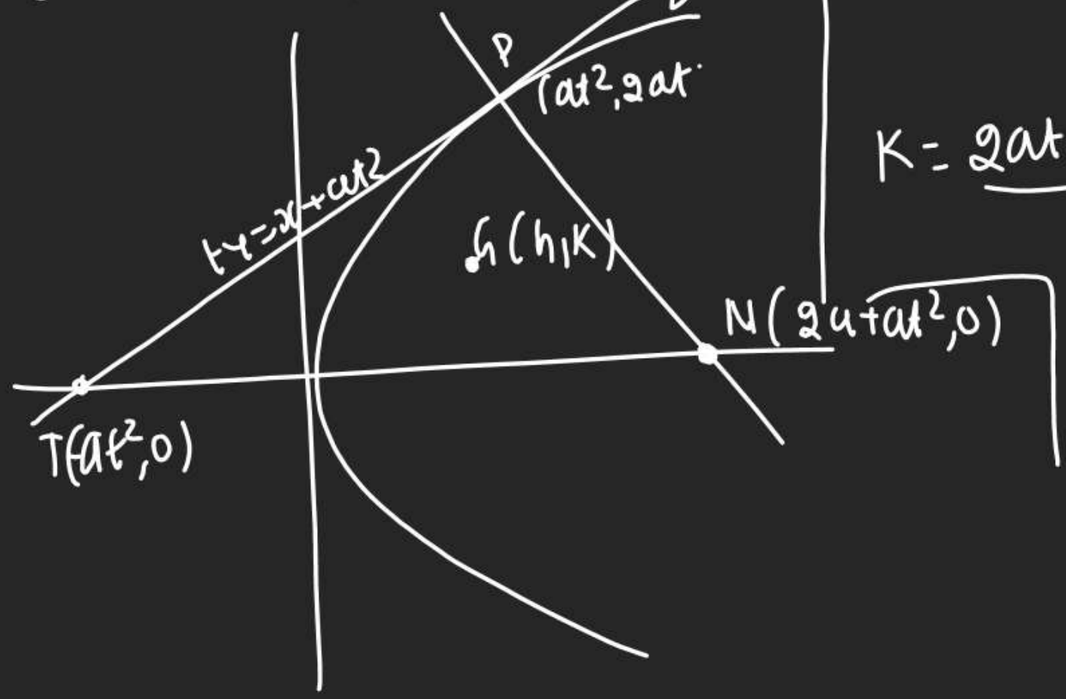
Q PT & PN are tangents & Normal at Pt. P of $y^2 = 4ax$ meet Axis at T & N Resp. find LOCUS of Centroid of $\triangle PTN$. If It is a Parabola. find Vertex, dir. & LR of It.



$h = \frac{at^2 + 2a + at^2 + -2at^2}{3}$

$K = \frac{2at + 0 + 0}{3}$

$t = \frac{3K}{2a}$

$at^2 = 3h - 2a$

$a\left(\frac{3K}{2a}\right)^2 = 3h - 2a$

$\frac{9y^2}{4a} = 3h - 2a$

$9y^2 = 4a(3x - 2a)$

$y^2 = \frac{4a}{9}(3x - 2a)$

③ LR $= 4A$
$= \frac{4a}{3}$.

$Y^2 = \frac{4a}{3}\left(x - \frac{2a}{3}\right)$

$Y^2 = 4AX$

$A = \frac{a}{3}$ | $X = x - \frac{2a}{3}$

① $X = 0, Y = 0$

$x - \frac{2a}{3} = 0, \; y = 0$

$\left(\frac{2a}{3}, 0\right)$

Dir ② $X = -A$

$x - \frac{2a}{3} = -\frac{a}{3}$

$x = a/3$