

$$at^2 = 4ax$$

$$x = \frac{at^2}{4}$$

Q.N. \rightarrow

$$(y-0) = \frac{0-at}{at^2 - \frac{at^2}{4}} (x - at^2)$$

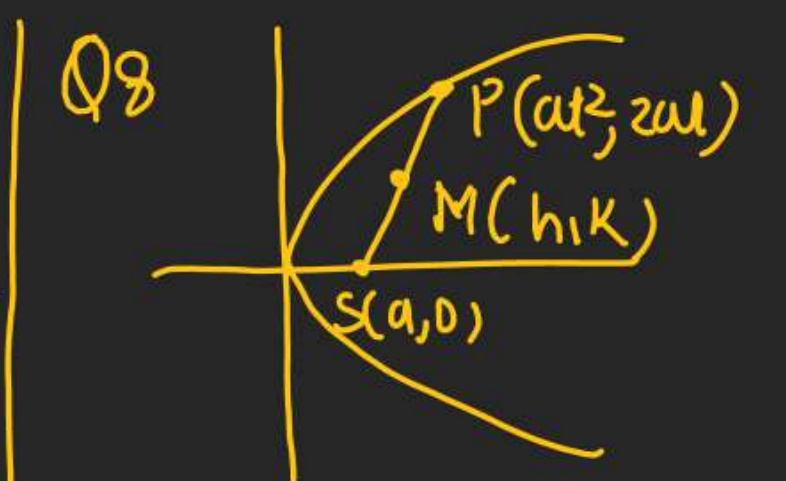
$$y = -\frac{4at}{3at^2} (x - at^2)$$

for $T \Rightarrow x=0$ put $y = +\frac{4}{3}at$

$$AT = KNP$$

$$2\frac{4at}{3} = K(2at)$$

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



Q9 $y^2 = 4x \Rightarrow a=1$

$$L_{FC} = Q(t + \frac{1}{t})'$$

Q10 $y^2 + 4y + 4 = 6x + 2 + 4$

$$(y+2)^2 = 6(x+1) \quad t_1 + t_2 = 1$$

$$h+1 = at_1t_2$$

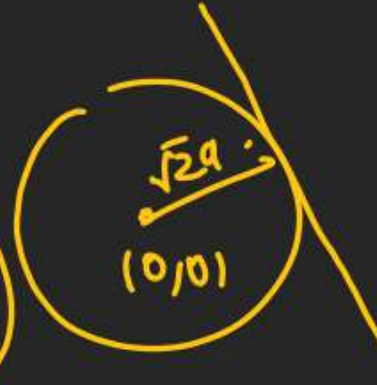
Q11 $x^2 + y^2 = (\sqrt{2}a)^2$

$y^2 = 8ax$

$y = mx + \frac{2a}{m}$

$mx(-y + \frac{2a}{m}) = 0 \quad (0, 0)$

$d = \frac{|\frac{2a}{m}|}{\sqrt{m^2 + 1}} = \sqrt{2}a$



Q12 $y^2 = (x - c)^2$

$A = \frac{1}{4}$

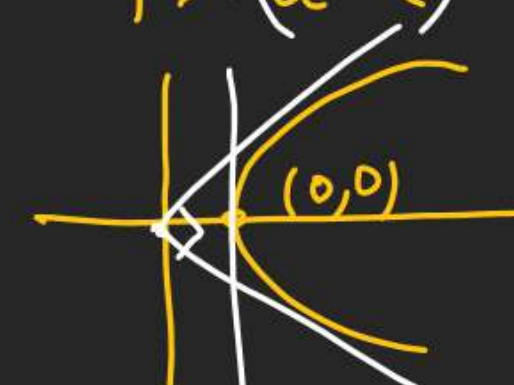
$x = -A$

$x - c = -\frac{1}{4}$

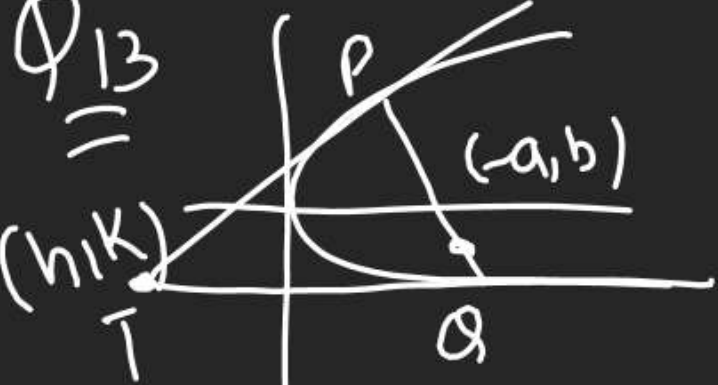
$x = 0, y = 0$

$-c = -\frac{1}{4}$

$c = \frac{1}{4}$



Q13



$2x - y(t_1 + t_2) + 2at_1t_2 = 0$

$-2a - b(t_1 + t_2) + 2at_1t_2 = 0$

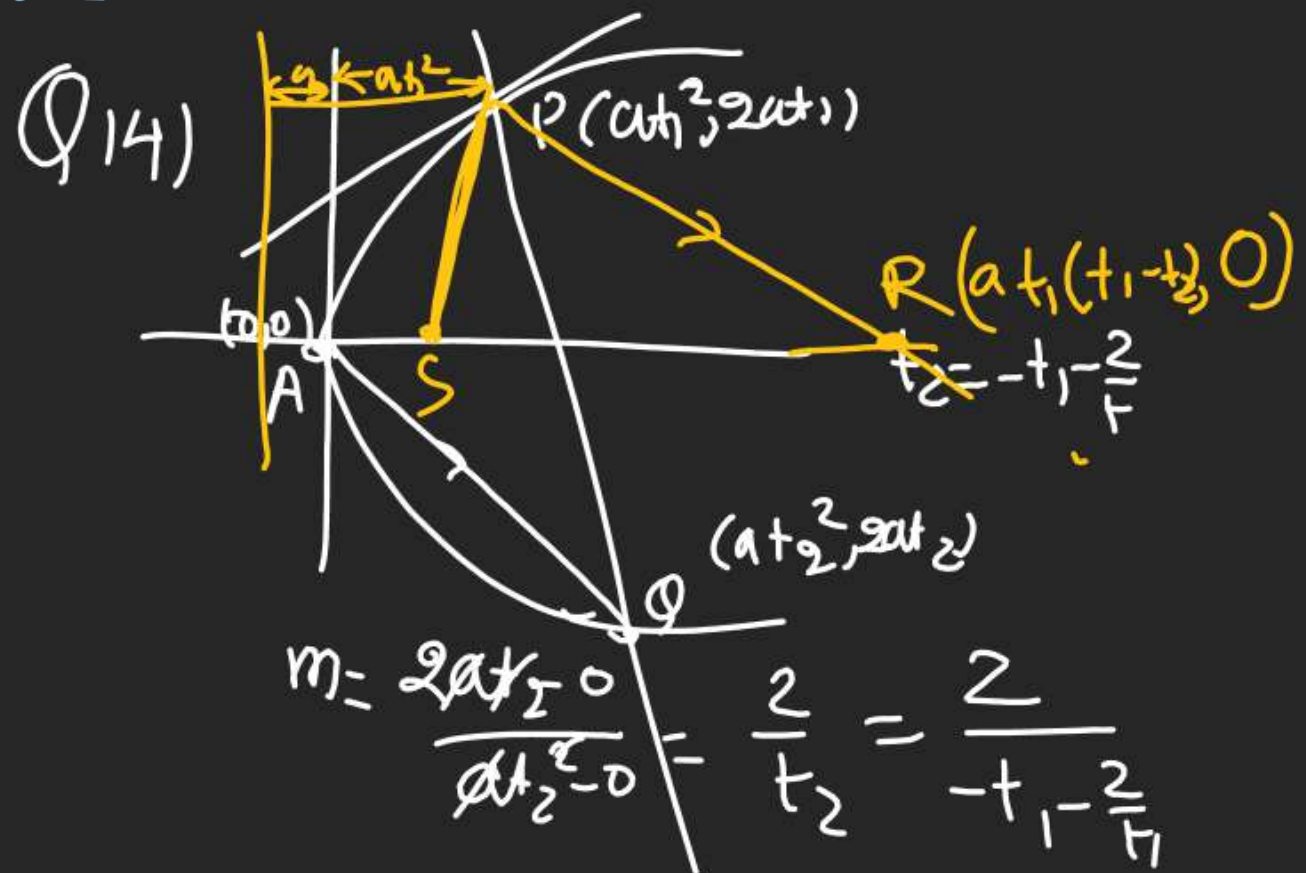
$-2a - \frac{bK}{a} + 2h = 0$

$\frac{bK}{a} = 2(h - a)$

$by = \frac{2a}{b}(x - a)$

$h = at_1t_2$

$K = a(t_1 + t_2)$



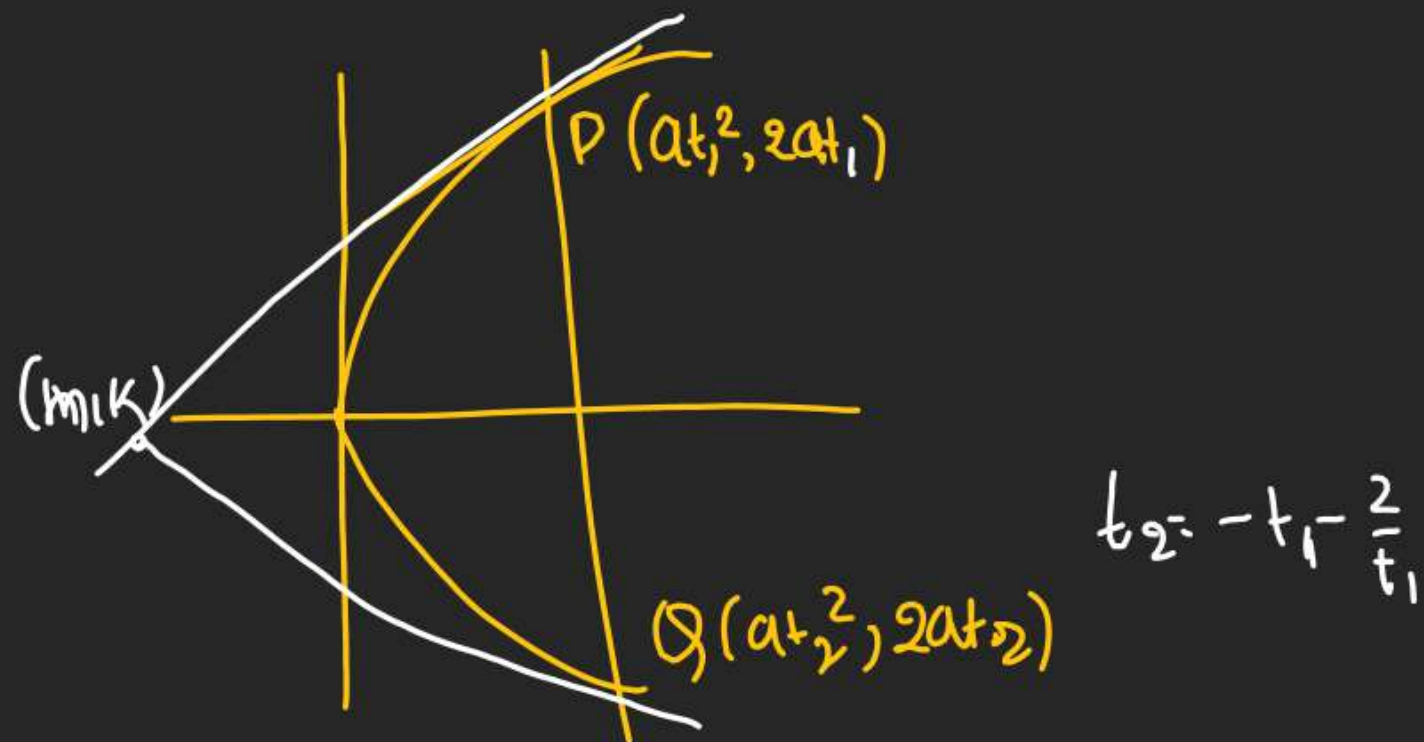
$$\begin{aligned}
 PR: & \Rightarrow (y - 2at_1) = \frac{2}{t_2} (x - at_1^2) \\
 & -2at_1 t_2 = 2(x - at_1^2) \\
 & x = at_1^2 - at_1 t_2
 \end{aligned}$$

$$\begin{aligned}
 L_{AR}: & \quad at_1(t_1 - t_2) \\
 & \quad at_1(t_1 + t_1 + \frac{2}{t_1}) \\
 & \quad at_1(2t_1 + \frac{2}{t_1}) \\
 & \quad \underline{2a(t_1^2 + 1)}
 \end{aligned}$$

Q15 $t_2 = -t_1 - \frac{2}{t_1}$

$$\begin{aligned}
 P' \Rightarrow F.D. &= a + at_1^2 \\
 &= a(t_1^2 + 1)
 \end{aligned}$$

$$L_{AR} = 2 \text{ of } F.D.$$



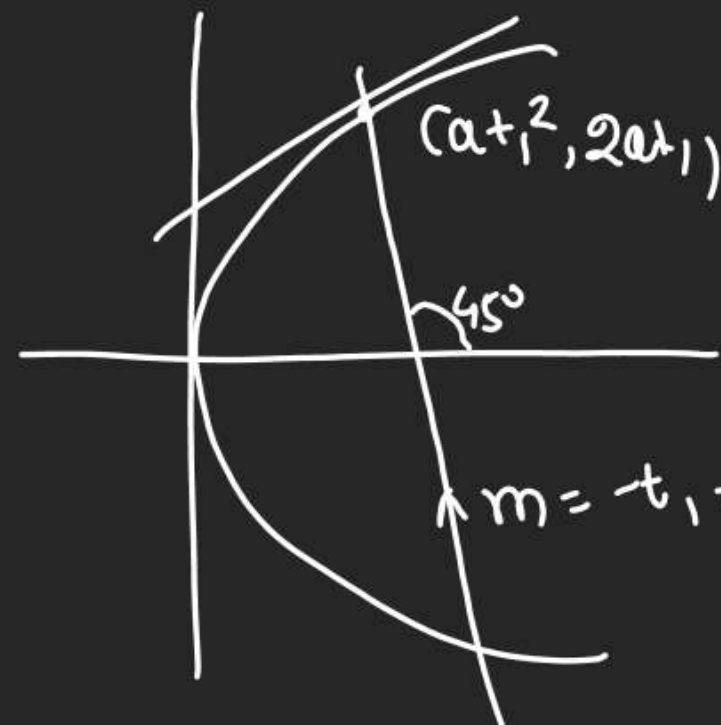
$$h = a t_1 t_2 = a t_1 \left(-t_1 - \frac{2}{t_1} \right) \Rightarrow$$

$$k = a(t_1 + t_2) = a \left(t_1 - t_1 - \frac{2}{t_1} \right)$$

$$k = -\frac{2a}{t_1} \Rightarrow t_1 = -\frac{2a}{k}$$

$$h = -a(t_1^2 + 2)$$

$$= -a \left(\frac{4a^2}{k^2} + 2 \right)$$



$$m = -t_1 = \tan \frac{\pi}{4} = 1$$

$$t_1 = -1$$

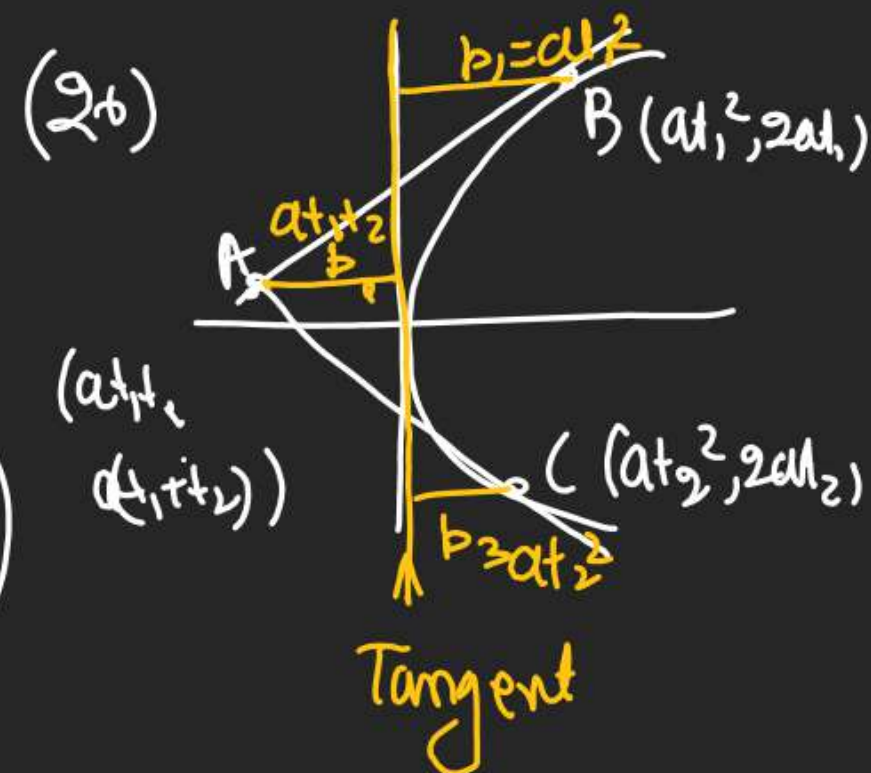
$$t_2 = -(-1) = \frac{2}{(-1)}$$

$$t_2 = 3$$

(g) copy.

(20) $4x - 7y + 10 = 0 \leftarrow \text{tangent}$
 $P.O. \rightarrow (x_1, y_1) \rightarrow y^2 = 4ax$
 $yy_1 = 2(x + x_1)$

(21) $\Delta = \frac{(y_1^2 - 4ax_1)^{3/2}}{4}$



$$at_1 t_2 = \sqrt{at_1^2 \cdot at_2^2}$$

$$p_2 = \sqrt{p_1 p_3}$$

$$p_1, p_2, p_3 \text{ are in H.P.}$$

Q 18) $x + y = K$ is N. of $y^2 = 12x$ (22) Done in copy.

$$y = -x + K$$

$$m = -1 \quad K = -2am - am^3$$

$$K = -2 \times 3(-1) - 3 \times (-1)^3 = 9$$

(23, 24)

(25) $y = mx + \frac{1}{m} \Rightarrow mx - y + \frac{1}{m} = 0$ (3, 0) $r = 3$
 $\frac{|3m - 0 + \frac{1}{m}|}{\sqrt{m^2 + 1}} = 3 \rightarrow m \text{ found}$