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DEPARTMENT OF MATHEMATICS

23MAT101 - MATRICES AND CALCULUS UNIT-III DIFFERENTIAL CALCULUS

Evolute: The locus of the centre of curvature of the given curve is called the evolute of the wave. Working procedure to find the evolute 1. White the parametric form of the given curve. 2. Find centre of curvature (2, 3) 3. Eliminate the parameter from \overline{r} 9 4. Taking locus of the above equation, we get the required evolute.

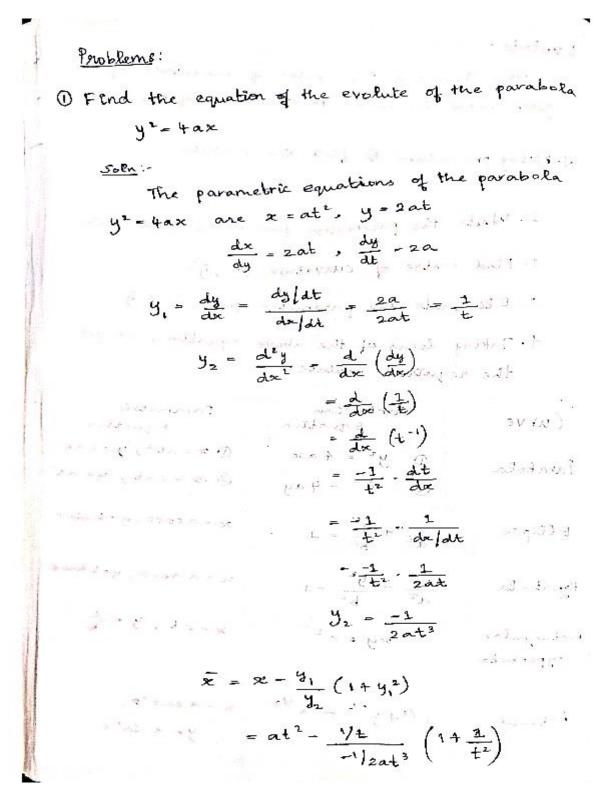
Carteston Equation	Parametric Equation.
$\begin{array}{c} 0 y^2 = 4 ax \\ \hline \end{array}$	Ox=at", y=zat @ x=zat, y=at"
$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$	>c= a case, y=b sino
$\frac{y^2}{a^2} - \frac{y^2}{b^2} = 1$	x=aseco,y=btano
y say = c2	90= c = , y = E
$x^{2/3} + y^{2/3} = a^{2/3}$	$y = a \cos^3 \theta$, $y = a \sin^5 \theta$.
	Equation $ \begin{array}{r} $





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• $at^{2} + \frac{1}{t} = 2at^{3} \left(1 + \frac{1}{t^{2}} \right)$ $= at^2 + 2at^2 \left(1 + \frac{1}{t^2}\right)$ = at + 2at + 2at . 1 $= at^2 + 2at^2 + 2a$ $\overline{x} = 3at^2 + 2a' \rightarrow t^2 - \frac{\overline{x} - 2a}{3a} \rightarrow 0$ $\bar{y} = y + \frac{1}{\bar{y}}(1+y^{2})$ = $2at + \frac{1}{-1b_{a+3}} \left(1 + \frac{1}{t^2} \right)$ = 2at - 2at² $(1 + \frac{1}{t^2})$ $= 2at - 2at^{3} - 2at^{3} + 2at^{3} + \frac{1}{t^{2}}$ $= 2at - 2at^{3} - 2at^{3} + \frac{1}{t^{2}}$ $= 2at - 2at^{3} - 2at$ y' = -2 at it is did in $\pm^3 = \frac{-5}{22} \longrightarrow @$ Taking cube of O & squaring @ we get,

$$(t^{*})^{3} = \left(\frac{\overline{z} - 2a}{3a}\right)^{3}$$
$$t^{4} = \frac{(\overline{z} - 2a)^{3}}{21a^{3}} \longrightarrow \emptyset$$





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