Differentiation

Monday, 23 March 2026 6:04 PM

$$x^2 + y^2 = 10$$

$$2x + 2y\left(\frac{dy}{dx}\right) = 0$$

$$\boxed{\frac{dy}{dx} = -\frac{x}{y}}$$

(a) $x^2 + 2xy + 3y^2 = 12$

(b) $\dfrac{x^2}{x+2y} = 3y^2$

$$\frac{u'v - v'u}{v^2}$$

(b) $\dfrac{x^2}{x+2y} = y^2$

$x^2 = y^2(x+2y)$

$x^2 = y^2x + 2y^3$

$2x = 2y\left(\dfrac{dy}{dx}\right)x + y^2 + 6y^2\dfrac{dy}{dx}$

$\dfrac{2x - y^2}{2y + 6y^2} = \dfrac{dy}{dx}$

$y = f(x)$

$y = f(t)$

$x = f(t)$

$\dfrac{dy}{dx} = \dfrac{dy}{dt} \times \dfrac{dt}{dx}$

$\frac{dx}{dt}$

$$\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}}$$

Q

$$x = 3 + 2\cos\theta$$

$$y = -3 + 2\sin\theta$$

$$\frac{dy}{dx} = \frac{3 - x}{3 + y}$$

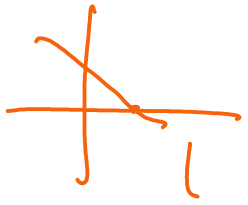
Q

$$x = \frac{1 - t^2}{1 + t^2} \quad , \quad y = \frac{2t}{1 + t^2}$$

Q

$$x = 4t - 1$$

$$y = \frac{5}{2t} + 10$$



$$\frac{dy}{dx} = \frac{-5}{4t^2} = \frac{-5}{8\left(\frac{-1}{4}\right)^2} = \frac{-5}{\frac{8}{16}} = -10$$

$$\frac{dy}{dx} = \frac{-5}{8\left(\frac{x+1}{4}\right)^2}$$

(1) Cuts x-axis at A, find the equation

of tangent at A

② Cartesian Equation

$$t = \frac{x+1}{4}$$

$$y = \frac{5}{2\left(\frac{x+1}{4}\right)} + 10$$

$$\boxed{y = \frac{10}{x+1} + 10}$$