

Differentiation

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- The slope of the normal to the curve $y = 2x^2 + 3 \sin x$ at $x = 0$ is _____.
The total revenue (in ₹) received from sale of x units of a product is $R(x) = 3x^2 + 36x + 5$. The marginal revenue, when $x = 12$ is _____.
- If $\sin y = x \sin(a + y)$, then prove that $\frac{dy}{dx} = \frac{\sin x^2(a+y)}{\sin a}$.
- Find the equation of tangent to the curve $y = x^2 + 4x + 1$ at the point (3,22).
- If $Y = \tan^{-1} \left(\frac{3x-x^3}{1-3x^2} \right)$, $-\frac{1}{\sqrt{3}} < x < \frac{1}{\sqrt{3}}$ then find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$.
- If $\sec^{-1} \left(\frac{1+x}{1-y} \right) = a$, then $\frac{dy}{dx}$ is equal to
- The order and degree of the differential equation of the family of parabolas having at origin and axis along positive x-axis is
- If $y = \log x$, then $\frac{d^2y}{dx^2} =$
- Find the intervals in which the function f defined as $f(x) = \sin(x) + \cos(x)$, $0 \leq x \leq 2\pi$ is strictly increasing or decreasing.
Prove that the radius of the right circular cylinder of greatest curved surface area which can be inscribed in a given cone is half of that of the cone.
- If $y = x^{\sin x} + \sin^{-1}(\sqrt{x})$, then find $\frac{dy}{dx}$.
- The supply function of a commodity is $100p = (x + 20)^2$. Find the Producer's Surplus (PS), when the market price is ₹25.
Find: $\int \frac{2x^2+1}{x^2-3x+2} dx$