Differentiation assignment

November 21, 2023

Questions

1. The order and degree of the differential equation of the family of parabolas having vertex at origin and axis along positive x-axis is:

   (a) 1,1

   (b) 1,2

   (c) 2,1

   (d) 2,2

2. If $y = \log x$, then $\frac{d^2y}{dx^2} =$ _____

3. If $y = \sqrt{a + \sqrt{a + x}}$:

4. Find the intervals in which the function f defined as $f(x) = \sin x + \cos x, 0 \leqslant x \leqslant 2$ 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.

5. If $y = x^{\sin x} + \sin^{-1} x$,then find $\frac{dy}{dx}$.