

Assignment (Group 5)

Calculus and Analytical Geometry

Energy and Environment - Batch 15

1. Define derivative of the function $f(x)$. Interpret derivative as rate of change of function. Write the function whose first and second derivatives are same.
2. If $x^2 + y^2 + z^2 = 1$, find the rate of at which z is changing with respect to y at the point $(\frac{2}{3}, \frac{1}{3})$.
3. Differentiate the *proper* and *improper* integration? Explain how integration is applied to engineering problems?
4. Find a function, whose minimum and maximum of a function on an interval $I = [a, b]$ are equal.
5. Suppose that the velocity of a moving body is $\frac{ds}{dt} = v = 9.8t - 3$. Find the body's displacement over the time interval from $t = 1$ to $t = 3$ given that $s = 5$ when $t = 0$. [Hint: Use antiderivatives/integration]
6. Find second order partial derivatives f_{xx} and f_{yy} of the function $f(x, y) = e^{xy^2}$.