King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 (151) Sec 01 - Quiz III

Name: ID: Serial No.:

1. If $h(x) = \dfrac{1 + xf(x)}{g(x)}$, $g(2) = 1, g'(2) = 3, f'(2) = 5$ and $h'(2) = 6$, find $f(2)$

2. If $y = \sqrt[3]{x^4} - \dfrac{1}{\sqrt[4]{x^3}}$. Then find $\frac{dy}{dx}|_{x=1}$

3. If the position of a particle is given by the equation

$$S(t) = 2t^3 - 9t^2 + 12t,$$

where t is measured in seconds and S in meters, then the total distance traveled by the particle during the time interval $[0, 2]$ is:

4. Find $\lim_{x \to 0} \dfrac{1 - \cos x}{x \sin x}$

5. If $f(x) = \begin{cases} 3, & \text{if} \quad x \leq 0 \\ 3 - x, & \text{if} \quad 0 < x < 2, \\ \frac{1}{3-x} & \text{if} \quad x \geq 2 \end{cases}$

Then f is not differentiable at what point(s).

6. The normal line to the parabola $y = x^2 + x$ at the point $(-1, 0)$ intersects the parabola a second time at what point.