

King Fahd University of Petroleum and Minerals  
Department of Mathematics and Statistics  
Math 101 (151) Sec 07 - Quiz III

Name:

ID:

Serial No.:

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

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

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  $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x \sin x}$

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

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.