King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 Section 19 Quiz III (Term 151)

Name : ..... **ID** #..... Serial #: .....

1. Why the following functions are not differentiable at $x = 3$.

   (a) $f(x) = (x-3)^{2/3}$

   (b) $f(x) = |x-3|$

(c) $f(x) = \begin{cases} x, & x \geq 3 \\ x - 1, & x < 3 \end{cases}$

2. Find an equation of the normal line to the function $f(x) = x^4 + 2e^x$ at the point $(0, 2)$.

3. If $f(x) = \dfrac{x^2}{1+x}$, then find $f''(1)$

4. If $g(x) = \dfrac{x}{e^x}$, then find $g^{(n)}(x)$

5. Find the values of x at which the curve $y = \dfrac{x}{2} + \dfrac{1}{2x-4}$ has slope $\dfrac{-3}{2}$

6. If $y = \left(1 + \dfrac{1}{x}\right)^3 + \left(1 - \dfrac{1}{x}\right)^3$, then find y'.