King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 (161) Sec 05 - Quiz 3

Name: ID: Serial No.:

1. If $y = \dfrac{4\sin x}{2x + \cos x}$, then find $y' =$

2. Find $\lim\limits_{x \to \frac{\pi}{4}} \dfrac{(\cot x) - 1}{x - \frac{\pi}{4}}$

3. Let $f(x) = \begin{cases} x^2 & x \leq -1 \\ mx + b & x > -1 \end{cases}$.

If the constants m and b make the function f differentiable everywhere, then find m and b.

4. If $F(x) = g(x) \cdot f(g(x))$, where $f(3) = 4$, $g(2) = 3$, $f'(3) = 5$, $g'(2) = 10$, then calculate the value of $F'(2)$

5. Let $f(x) = x^n e^x$, where n is a positive integer. Then, compute $f^{(n)}(x)$ at $x = 0$

6. If $f(x) = \tan^2\left(x^2 - \dfrac{3\pi}{4}\right)$, then calculate the value of $f'(\sqrt{\pi})$