King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 (142) Sec 15 - Quiz 5

Name: ID: Serial No.:

1. Find a constant c that satisfies the conclusion of the mean value theorem when applied to $f(x) = x^4 - x$ on $[-1, 1]$

2. Suppose that f is differentiable on $\mathbb{R}$ and satisfies $2 \leq f'(x) \leq 6$ for all values of x. Then find a and b, where $a \leq f(5) - f(3) \leq b$

3. Find the critical point(s) of $f(x) = \dfrac{x^2 + 3}{\sqrt{2x + 1}}$

4. Find the absolute maximim and minimum of $f(x) = \cos^2 x - \cos x, \quad -\frac{\pi}{2} \leq x \leq \pi$

5. If the function $f(x) = axe^{bx^2}$ has the maximum value $f(2) = 1$ where a and b are real numbers, then find a and b