King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 (142) Sec 15 - Quiz 2

Name: ID: Serial No.:

1. Let $f(x) = \dfrac{x-3}{|x|-3}$

   (a) Find the point(s) of discontinuity of f.

   (b) Classify the point(s) found in (a) as removable or not removable. Justify your answer.

2. Use Intermediate Value Theorem to show that the equation $e^{-x} = 2 - x - x^4$ has two solutions.

3. Find all asymptotes of the graph of $f(x) = \dfrac{2x^2 + 3x - 2}{3x^2 + 4x - 4}$. Justify your answer using limits.

4. Find all value(s) of a and b that make f continuous everywhere

$$f(x) = \begin{cases} x^2 + b & \text{if} \quad x \leq 1 \\ ax + 2 & \text{if} \quad 1 < x \leq 3 \\ 2x + a & \text{if} \quad x > 3 \end{cases}$$

5. Find $\lim_{x \to -\infty} \sqrt{x^2 + 2} + 3x$