King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 (132) - Quiz II

Name: ID: Serial No.:

1. Use the Intermediate Value Theorem to prove that the equation $e^{-x} = 2 - x - x^4$ has a solution.

2. find $\lim_{x \to -\infty} \dfrac{3x^3 + 2}{\sqrt{9x^6 - x^4}}$

3. Use limits to determine the equations for all asymptotes of $f(x) = \dfrac{x^3 + 1}{x^2 - x - 2}$

4. Find $\lim_{\theta \to 0} \dfrac{\sqrt{3\theta + 5} - \sqrt{5}}{2 \sin \theta}$

5. For what values of a and b is

$$f(x) = \begin{cases} x + 2a & x < 0 \\ ax^2 + b & 0 \leq x \leq 1 \\ \frac{x-b}{bx+1} & x > 1 \end{cases}$$

6. Let $f(x) = \dfrac{x^2 - 9}{x^2 - 2x - 3}$

   (a) Find the points of discontinuity of f.

   (b) Classify the points found in part (a) as removable, jump or infinite discontinuity. Justify your answer.