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 $\cos x = x$ has a solution.

2. find $\lim_{x \to -\infty} \dfrac{2x^3 + 1}{\sqrt{x^6 - 9x^4}}$

3. Use limits to determine the equations for all asymptotes of $f(x) = \dfrac{x^3 - 8}{x^2 - x - 2}$

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

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 $f(x) = \dfrac{x^2 - 16}{x^2 - 3x - 4}$

   (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.