

King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 (152) Sec 01 - Quiz 2

Name:

ID:

Serial No.:

1. Using $\epsilon - \delta$ definition prove that $\lim_{x \rightarrow -3} (1 - 4x) = 13$

2. Where is the function $f(x) = \frac{\ln(1-x)}{\sqrt{1+x}}$ continuous?

3. Find the values of a and b that make f continuous everywhere.

$$f(x) = \begin{cases} \frac{x^2 - 4}{x - 2} & \text{if } x < 2 \\ ax^2 - bx + 3 & \text{if } 2 \leq x < 3 \\ 2x - a + b & \text{if } x \geq 3 \end{cases}$$

4. Use the Intermediate Value Theorem to show that the function $f(x) = \sin x$ and $g(x) = x^2 - x$ intersect over the interval $(1, 2)$

5. Find all horizontal asymptotes of $f(x) = \sqrt{x^2 + ax} - \sqrt{x^2 + bx}$

6. Find $\lim_{x \rightarrow \infty} \left(\frac{x - x\sqrt{x}}{2x^{3/2} + 3x - 5} \right)$