

King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 Major Quiz 2

Name : ID #.....Sec# Serial #:

Question 1[6 points]: Please, find the following limits :)

1. $\lim_{x \rightarrow 5^-} [|3x|] + [| - 3x|]$

2. $\lim_{x \rightarrow 2} \frac{x^3 - 8}{2x^2 - x - 6}$

3. $\lim_{x \rightarrow 1^-} \frac{|x^2 - 3x + 2|}{x\sqrt{x} - \sqrt{x}}$

Question 2 [3 points]: Use the Sandwich (Squeeze) Theorem to calculate the limit,

$$\lim_{x \rightarrow 0} \tan(\pi x) \cos\left(\frac{\pi}{x}\right).$$

Question 3 [3 points]: Use the Intermediate Value Theorem to show that the equation, $x^x = 3x - 1$, has a solution.

Question 4 [4 points]: Use limits to find the horizontal and vertical asymptotes of the curve,

$$g(x) = \frac{x^2 - 5x + 6}{4 - x^2}.$$

Question 5 [4 points]: Consider the curve, $f(x) = \sqrt{2x + 5}$.

a) Use limits to find the derivative of f .

b) Find the equation of the tangent line to the curve at $x = -2$.