

Name: _____

Math 1300-005 - Spring 2017

Quiz 3 - 2/3/17

On my honor, as a University of Colorado at Boulder student, I have neither given nor received unauthorized assistance on this work.

Signature: _____

Guidelines: You are permitted to use notes, the book, in-class worksheets/solutions, and your classmates on this quiz. Computers and graphing technology of any kind, including calculators, are not allowed (exceptions made for those who have an e-book). Please show all work and clearly denote your answer.

1. Use the squeeze theorem to evaluate the following limits. Remember, there is a step-by-step process to answering these, so please include all steps that are necessary.

(a) $\lim_{x \rightarrow 0} |x| \sin\left(\frac{4}{x}\right)$

(b) $\lim_{x \rightarrow \infty} \left(\frac{1}{x^4}\right) \cos(x)$

2. (a) Let $f(x) = x^4 + 5x^3 - 2x^2 - 7$. Use the Intermediate Value Theorem to show $f(x)$ crosses the x -axis in the interval $[-1, 2]$. You must justify your use of the IVT to receive credit.

- (b) Let $g(x) = \ln(x) + 2x - 3$. Use the Intermediate Value Theorem to show $g(x)$ crosses the x -axis in the interval $[1, e]$. You must justify your use of the IVT to receive credit.

3. For what value of the constant c is the function f continuous on $(-\infty, \infty)$?

$$f(x) = \begin{cases} cx + 5 & \text{if } x \leq 2 \\ 7x - c & \text{if } x > 2 \end{cases}$$

4. Compute the following limits. Show all work, and if necessary, explain your reasoning to receive full credit.

(a) $\lim_{x \rightarrow 3^-} \frac{x+1}{x-3}$

(b) $\lim_{x \rightarrow -\infty} \frac{2x^3 + x - 1}{x^2 + x + 2}$