

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH101 - Section 17 (Term 151)

Date: September 13, 2015

Quiz 1

Duration: 20 minutes

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Family Name: \_\_\_\_\_ ID #: \_\_\_\_\_ Serial #: \_\_\_\_\_

1. Use the Squeeze Theorem to find  $\lim_{x \rightarrow 4} f(x)$ , if  $4x - 9 \leq f(x) \leq x^2 - 4x + 7$  for  $x \geq 0$ .

(3 points)



2. Let  $f(x) = \frac{x}{x-2}$ ,  $a = 4$ , and  $L = 2$ . Find a real number  $\delta > 0$  that works for  $\varepsilon = \frac{1}{2}$ , such that:

$$0 < |x - a| < \delta \Rightarrow |f(x) - L| < \varepsilon$$

(8 points)



3. Evaluate the following limits or explain why they are not exist:

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

(b)  $\lim_{t \rightarrow 2} \left( \frac{t^2 - 2}{t^3 - 3t + 5} \right)^2$

(c)  $\lim_{t \rightarrow 0} \frac{\sqrt{1+t} - \sqrt{1-t}}{t}$

**(3 + 2 + 4 = 9 points)**

# KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

## DEPARTMENT OF MATHEMATICS & STATISTICS

### MATH101 - Section 26 (Term 151)

Date: September 13, 2015

Quiz 1

Duration: 20 minutes

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Family Name: \_\_\_\_\_ ID #: \_\_\_\_\_ Serial #: \_\_\_\_\_

1. Use the Squeeze Theorem to show that:

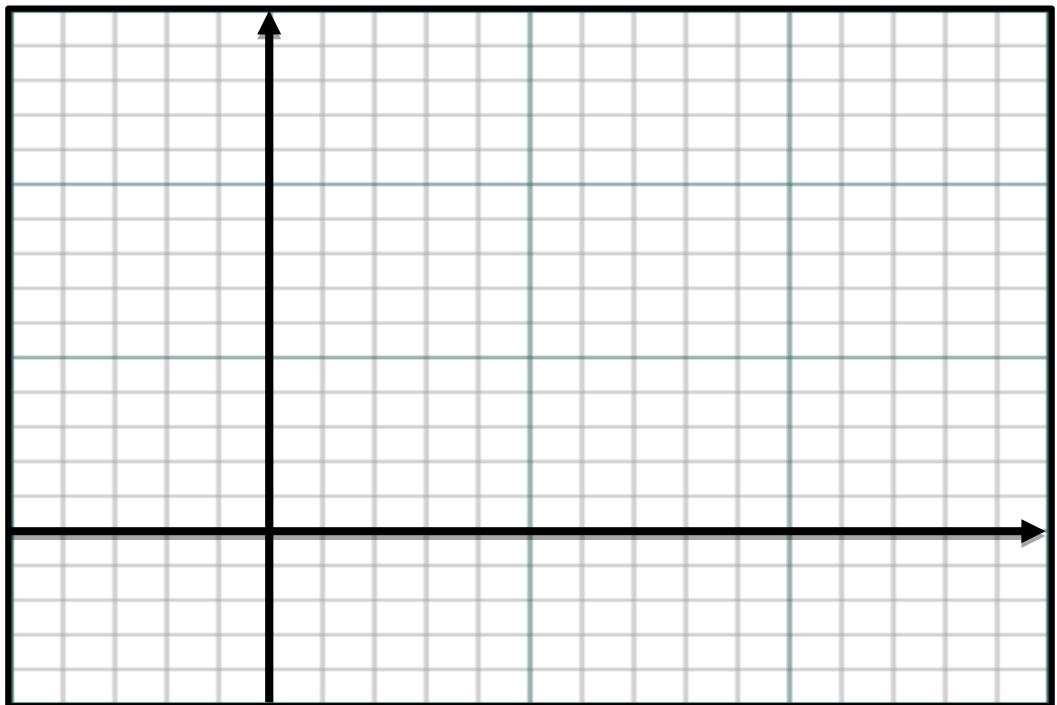
$$\lim_{x \rightarrow 0} x^4 \cos\left(\frac{2}{x}\right) = 0$$

(4 points)



2. Let  $f(x) = \sqrt{x-3}$ ,  $a = 7$ , and  $L = 2$ . Use the graph of  $f(x)$  to find a real number  $\delta > 0$  that works for  $\varepsilon = 1$ , such that:

$$0 < |x - a| < \delta \Rightarrow |f(x) - L| < \varepsilon$$



(7 points)

3. Find  $\lim_{x \rightarrow 1^-} f(x)$  if:

(a)  $f(x) = \frac{x - 1}{|x^3 - x^2|}$

(b)  $f(x) = \frac{\sqrt{8x + 1} - 3}{x - 2}$

(c)  $\lim_{x \rightarrow 1} \frac{f(x) - 8}{x - 1} = 10$

**(4 + 2 + 3 = 9 points)**