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Name _____

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Calculus I

Quiz # 2A

89

Name danica ramirez

ID. 201970131

I. Write the letter of the correct answer on the line.

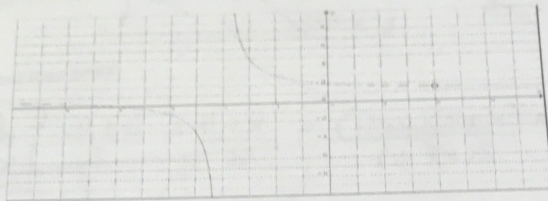
(10 points each)

1. I

1. ~~A~~ C Find $\lim_{x \rightarrow \infty} (6 + \frac{1}{x^2})$ $\lim_{x \rightarrow \infty} (6 + 0) = 6$

(A) 0 (B) ∞ (C) 6 (D) 1

2. b Use the following graph to determine $\lim_{x \rightarrow \infty} f(x)$



2.

A) 2

(B) 1

C) 1.8 ∞

D) 0

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

A) $-\infty$

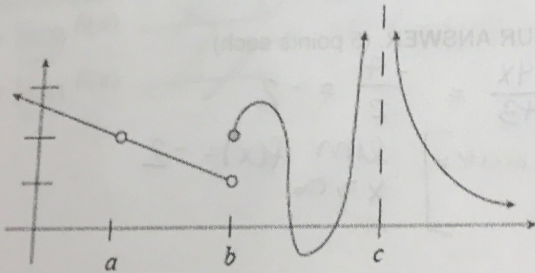
(B) $+\infty$

C) 0

D) $\frac{1}{9}$

2.99	2.9	3	3.001	3.01
10000	100		10000	10000

II. For the function $f(x)$ whose graph is given, find the following limits (20 points)



a) $\lim_{x \rightarrow +\infty} f(x) = 0$

b) $\lim_{x \rightarrow -\infty} f(x) = \infty$

c) $\lim_{x \rightarrow c} f(x) = \infty$

d) $\lim_{x \rightarrow b^-} f(x) = 1$

Instructions: Solve the following exercises. Remember to write your solution procedure in an orderly fashion. (10 points each)

I. Find the following limits

1. $\lim_{x \rightarrow -2} \frac{3x^2 + 4x - 4}{2x^2 + 3x - 2} = \frac{(3x-2)(x+2)}{(2x-1)(x+2)} = \frac{-6-2}{-4-1} = \frac{-8}{-5}$

$\lim_{x \rightarrow -2} f(x) = \frac{8}{5}$

2. $\lim_{x \rightarrow 5} \frac{x^2 - 25}{x - 5} = \frac{(x-5)(x+5)}{x-5} = \lim_{x \rightarrow 5} f(x) = 10$

3. $\lim_{x \rightarrow 3} \left(\frac{x^2 + 14x + 33}{2x + 6} \right) = \frac{(x+3)(x+11)}{2(x+3)} = \frac{x+11}{2} = \frac{3+11}{2} = 7$

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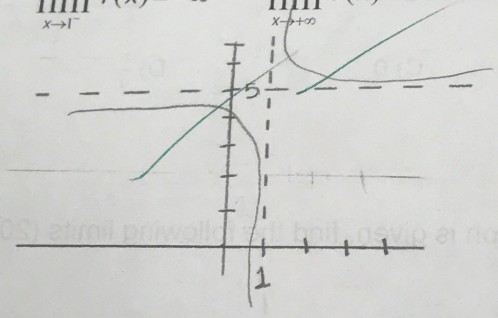
II. Graph an example of a function that satisfies the following conditions: (10 points)

a) $\lim_{x \rightarrow 1^+} f(x) = +\infty$

$\lim_{x \rightarrow 1^-} f(x) = -\infty$

$\lim_{x \rightarrow +\infty} f(x) = 5$

$\lim_{x \rightarrow -\infty} f(x) = 5$



III. Evaluate the following limits. JUSTIFY or EXPLAIN YOUR ANSWER. (5 points each)

a) $\lim_{x \rightarrow \infty} \frac{5-4x}{2x+3} = \frac{4}{2} = 2$

$\lim_{x \rightarrow \infty} \frac{5-4x}{2x+3} = \frac{-4}{2} = -2$

$\lim_{x \rightarrow \infty} f(x) = 2$

[numerator + denominator have same degree]

$\lim_{x \rightarrow \infty} f(x) = -2$

b) $\lim_{x \rightarrow \infty} \left(\frac{4x-2}{x^3+5x} \right) =$

$\lim_{x \rightarrow \infty} f(x) = 0$ [n < m]