Serial No.:_____ Student Name:_____ Student Number: _____

Instructor: M. Z. Abu-Sbeih Math 101- Q1 Date: 3-3-2007

Problem 1: (15 points) If it exists, find the limit. Use the symbols $\infty \text{ or } -\infty$ as appropriate.

a) $\lim_{x \to 1^-} \dfrac{x^2 - 2x}{x + 1}$

b) $\lim_{x \to 1} \dfrac{x^2 - 1}{|x|}$

c) $\lim_{y \to 0} \dfrac{4y + y^2}{3y - y^2}$

d) $\lim_{x \to 3^-} \dfrac{x + 4}{x^2 - 3x}$

e) $\lim_{x \to 1} \dfrac{\sqrt{x + 3} - 2}{x - 1}$

Problem 2: (5 points) consider the graph of the function $f(x)$ whose graph is sketched below. Determine whether each of the following statements is true or false (CIRCLE ONE).

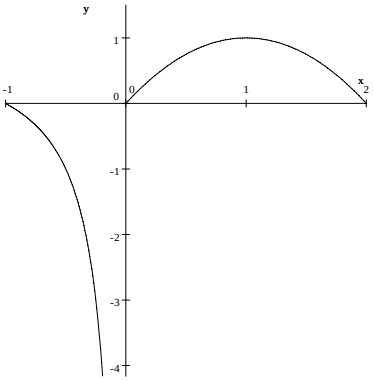
a. $\lim_{x \to 1} f(x) = 1$ T F

b. $\lim_{x \to 1} f(x) = f(1)$ T F

c. $\lim_{x \to 0} f(x)$ does not exist. T F

d. $\lim_{x \to 1} \dfrac{f(x)}{x - 1} = \infty$ T F

e. $f(x)$ has a vertical asymptote T F



Problem 2: (5 points) Use the $\in -\delta$ definition of the limit to show that $\lim_{x \to 1} (2 - 3x) = -1$.

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Problem 1: (15 points) If it exists, find the limit. Use the symbols $\infty \text{ or } -\infty$ as appropriate.

a) $\lim_{x \to 1^-} \dfrac{x^2 - 4x}{x + 1}$

b) $\lim_{x \to 1} \dfrac{2x^3 - 2}{|x|}$

c) $\lim_{y \to 0} \dfrac{4y + y^2}{5y - y^2}$

d) $\lim_{x \to 3^-} \dfrac{x + 2}{x^2 - 3x}$

e) $\lim_{x \to 1} \dfrac{x - 1}{\sqrt{x + 3} - 2}$

Problem 2: (5 points) consider the graph of the function $f(x)$ whose graph is sketched below. Determine whether each of the following statements is true or false (CIRCLE ONE).

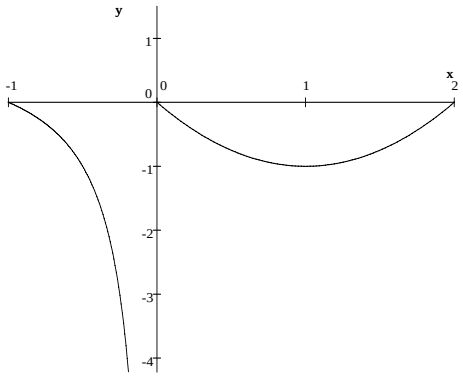
a. $\lim_{x \to 1} f(x) = -1$ T F

b. $\lim_{x \to 1} f(x) = f(1)$ T F

c. $\lim_{x \to 0} f(x)$ does not exist. T F

d. $\lim_{x \to 1} \dfrac{f(x)}{x - 1} = \infty$ T F

e. $f(x)$ has a vertical asymptote T F



Problem 2: (5 points) Use the $\in -\delta$ definition of the limit to show that $\lim_{x \to 1} (2 - 4x) = -2$.

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Problem 1: (15 points) If it exists, find the limit. Use the symbols $\infty \text{ or } -\infty$ as appropriate.

a) $\lim_{x \to 1^-} \dfrac{x^2 - 3x}{x + 1}$

b) $\lim_{x \to 1} \dfrac{x^4 - 1}{|x|}$

c) $\lim_{y \to 0} \dfrac{5y + y^2}{3y - y^2}$

d) $\lim_{x \to 3^-} \dfrac{x + 1}{x^2 - 3x}$

e) $\lim_{x \to 1} \dfrac{2 - \sqrt{x + 3}}{x - 1}$

Problem 2: (5 points) consider the graph of the function $f(x)$ whose graph is sketched below. Determine whether each of the following statements is true or false (CIRCLE ONE).

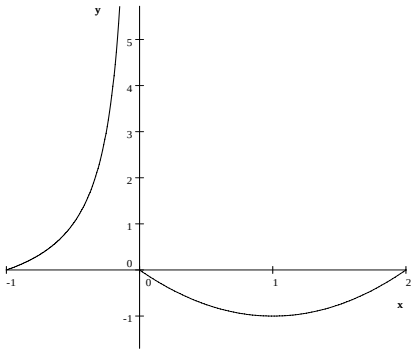
a. $\lim_{x \to 1} f(x) = -1$ T F

b. $\lim_{x \to 1} f(x) = f(1)$ T F

c. $\lim_{x \to 0} f(x)$ does not exist. T F

d. $\lim_{x \to 1} \dfrac{f(x)}{x - 1} = -\infty$ T F

e. $f(x)$ has a vertical asymptote T F



Problem 2: (5 points) Use the $\in -\delta$ definition of the limit to show that $\lim_{x \to 1} (2 - 5x) = -3$.