MATH 110-003, QUIZ 2

October 4, 2016
Time: 15 minutes

Show all your work. No calculators, no books/notes are allowed.

Name (please print): _____

Student number: _____

1. Determine whether the following statements are True or False. Provide justification or a counter-example.

(a) (3 points) If $\lim_{x\to -1} f(x) = 4$, then $f(-1) = 4$.

(b)(5 points) If $g(x) = \begin{cases} \dfrac{x^2-6x+8}{x-4} & x < 4 \\ \sqrt{x} & x \geq 4 \end{cases}$, then $\lim_{x\to 4} g(x)$ does NOT exist.

2. Find the following limits.

(a) (2 points) $\lim_{x\to -1} \dfrac{|x-3|}{\sqrt{x+5}} =$

(b) (2 points) $\lim_{x\to -4^+} \dfrac{1-\dfrac{1}{x}}{x+4} =$

3. (5 points) Sketch the graph of a function $f(x)$ (of your choice) satisfying all the following conditions:

- $f(-1) = 0$
- $\lim_{x \to -1} f(x)$ does NOT exist.
- $\lim_{x \to 1} f(x) = 2$

(Hint: It can be a piece-wise function. Make sure your graph pass the vertical line test to be a function!)

3. (5 points) The following graph shows the position function of a car that starts its trip at home, and comes back after 5 hours. Use the following graph to answer questions:

(a) What is the initial velocity of the car?

(b) Between what points has the car stopped moving?

(c) At what point the car has a negative velocity? How do you interpret the negative velocity?

(d) Is the car moving slower at A or B?