LB 118, Sections 009 & 010, Fall 2015
Homework 2 (due 9/18)

Instructions: Please write your solutions to the problems below on a clean piece of paper (not this piece of paper). You will not need more than one page (front and back) to write your answers. Show the steps taken to arrive at each answer. Do not include scratch work, doodles, scribbles, crossed out work, etc.; instead, carefully write your solutions after you have figured out the answers and checked them over.

1. (a) Sketch a graph of a function for which the limit of $f(x)$ as x approaches 0 is equal to 1, but $f(0) = 2$. (You do not need to write an algebraic description of your function; only make a sketch of its graph.)

   (b) Sketch a graph of a function for which the limit as x approaches 0 from the left is equal to 1, but the limit as x approaches 0 from the right is positive infinity. (You do not need to write an algebraic description of your function; only make a sketch of its graph.)

2. (a) Give an example of two functions $f(x)$ and $g(x)$ with the following properties (holding simultaneously):

   i. $\lim\limits_{x \to -1} f(x) = 0$

   ii. $\lim\limits_{x \to -1} g(x) = 0$

   iii. $\lim\limits_{x \to -1} \dfrac{f(x)}{g(x)} = 42$

   For this problem, you *are* to give an algebraic description of the functions, e.g. $f(x) = 27x^2 - 32$.

   (b) Write a sentence or two which answers the following question: Why is a limit of the form $\frac{0}{0}$ called an *indeterminate form*?