Math 4303 **FUNDAMENTALS OF MATH** Fall 2013
Dr. Duval **Homework**
Thursday, October 17

Follow the separate general guidelines for Parts A,B,C. Be sure to include and label *all four* standard parts (a), (b), (c), (d) of Part A in what you hand in.

Limit behavior of real functions

Section 3.2.4

A: Reading questions. Due by 3pm, Wed., 23 Oct.

1. Sketch the graph of a function f such that f diverges to ∞ as x approaches c from the left for some value c. (You get to pick c. Just say what value of c you are using.)
2. Find a function f with 3 different vertical asymptotes. Explain how you know where the vertical asymptotes are. Sketch the graph of f (you can use graphing software for this), and point out the vertical asymptotes.
3. What does "end behavior" have to do with asymptotes?
4. What result is Question 3 [in the textbook] illustrating?
5. Give an example of two functions that have the same order of growth. Then give an example of two functions f and g such that f has a higher order of growth than g. Don't use examples from the textbook. Explain why your answers are correct.

B: Warmup exercises. For you to present in class. Due by the end of class Thu., 24 Oct.

3.2.4 Problems: 1bdfgh, 6, 7, 12

Fitting linear and exponential functions to data

Section 3.3.1

A: Reading questions. Due by 3pm, Mon., 28 Oct.

1. Right after Table 4, the text claims that one of the functions $f(x), g(x), h(x)$ can be well described by an exponential function, one that can be described by a polynomial function, and one that cannot be well described by either. Which is exponential, and how can you tell? Show that the other two are not linear. [Note: Even though this is the first reading question, you may have to do it last. But think about it as you read this section, and the next.]
2. Make another example like Example 1, including showing how someone else could deduce it is well modeled by a linear function.
3. Show carefully that your example in the previous question satisfies Theorem 3.15.
4. Explain in your own words the difference between **rate of change** and **growth rate**.
5. How can you detect whether a function can be well described by an exponential function? Illustrate with an example.

B: Warmup exercises. For you to present in class. Due by end of class Tue., 29 Oct.

3.3.1 Problems: 6, 7