Due Wednesday, August 28

Important: As with everything else in life, being right is not enough. Please show your work, write in complete sentences, and explain your reasoning clearly.

(a) What is a function? (This is the most important question in all of mathematics.)

(b) Suppose that f is a function whose domain and range are subsets of the real numbers. Explain how to draw the graph of f, and what the graph represents.

(c) Explain what it means to say that
$$\lim_{x \to a} f(x) = c.$$

(d) Define the *derivative* of a function. Define it using an equation, and also explain your definition in English. In addition, draw a picture and explain why your equation describes the tangent line to the graph.

(e) Define the *antiderivative* of a function.

(f) Define the *definite integral*
$$\int_a^b f(x)dx.$$

Give an equation, and explain why your equation gives the area underneath the curve from $x = a$ to $x = b$.

(g) What does the fundamental theorem of calculus say? Why is it true? Explain thoroughly.

(h) Thomas: Ch. 3, 'Practice Exercises' at end of chapter: 2, 4, 9, 10, 12, 13, 18, 32, 35, 41, 44, 50, 54, 57, 119, 129.