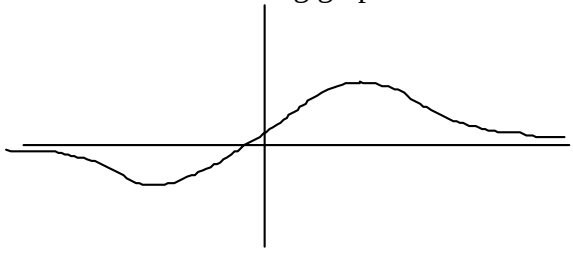
Math 151 Homework 5 due March 5, 1998 Name _____

Each problem is worth 5 points. #4a is 2 points 4b is 3 points.

1. Draw an example of a continuous function on a finite interval that doesn't have an absolute maximum, but does have an absolute minimum. Explain why your example does not violate Theorem 1 of section 4.2.

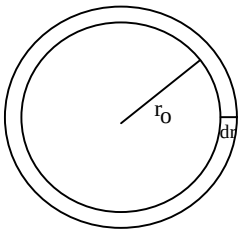
2. On page 213, example 5 shows a function with a local minimum at $x = 0$ and $f'(0) \neq 0$. Does this violate Theorem 2 (page 212)? Why or why not?

3. Suppose you are trying to use Newton's method to find the root of a function that looks like the following graph:



Shade the entire interval along the x-axis where your initial guess could be, so that you would eventually find the root using Newton's method.

4. (a.) Write a differential formula that estimates the change in area of a circle when the radius changes from r_o to $r_o + dr$.



(b.) What does your answer represent geometrically? Explain why this makes sense.