Math 31L Quiz #4

Blake, Fall 1996

Name_____

1. (6 points) The graph to the right is the graph of $f'(t)$. Among the graphs below are the graphs of $f(t)$ and $f''(t)$. [All of the ranges on the axes are the same from graph to graph.] Indicate which graph is $f(t)$ and which is $f''(t)$.

[The graphs were physically pasted on this page.]

2. (4 points) Suppose g is a differentiable function and that its derivative, g', has exactly two zeros. What are all of the possibilities for the number of zeros that g could have? Draw an example for each case.

3. (3 points) Suppose that a function f is differentiable and that f has exactly two zeros. What are all of the possibilities for the number of zeros that f' could have? Draw an example for the least and most.

(over)

4. (3 points) Suppose that h is a differentiable function of t and that its derivative, h', has a zero at $t = 4$ and no other zeros. How many zeros could f have to the right of $t = 4$? Explain your answer.

5. (4 points) Suppose that f, f', and f'' exist at all values of x. Suppose, also, that f' has a local maximum at $x = 1$. Circle every statement below which must be true.

f has a maximum at $x = 1$.

f has a minimum at $x = 1$.

f has a zero at $x = 1$.

f' has a zero at $x = 1$.

f'' has a zero at $x = 1$.

f has an inflection point at $x = 1$.

f' has an inflection point at $x = 1$.

f'' has an inflection point at $x = 1$.

f is steeper at $x = 1$ than at nearby points.

f is flatter at $x = 1$ than at nearby points.