More Practice for the First Test

Name: _____

Complete each of the following problems. Show all necessary work.

1. Given $f(x)=\begin{cases} x^3-5 & x\le 1 \\ x^2-3 & x>1 \end{cases}$ find:

   a. $\lim_{x\to 1^-} f(x) =$

   b. $\lim_{x\to 1^+} f(x) =$

   c. $\lim_{x\to 1} f(x) =$

2. Find the average velocity for the position function $s(t)=2t^2-t+4$, in cm, over the interval $1\le t\le 6$, where t is in seconds. Be sure to state the units in your answer. (cm/sec)

3. Use the definition of derivative $f'(a)=\lim_{h\to 0}\frac{f(a+h)-f(a)}{h}$ to calculate $f'(4)$ if $f(x)=\frac{2}{x^2}$.

4. Use the definition of derivative $f'(x)=\lim_{h\to 0}\frac{f(x+h)-f(x)}{h}$ if $f(x)=5x^2-4x+3$.

5. Find the equation of the tangent line to the graph of $f(x)=2x^5-8x^3+5x$ when $x=-1$.

In 6-8 evaluate each limit.

6. $\lim_{h\to 0}\frac{5\sqrt{3+h}-5\sqrt{3}}{h}$

7. $\lim_{h\to 0}\frac{(6h-11)^2-121}{h}$

8. $\lim_{x\to -11}\frac{x^2+7x-44}{x^2-121}$

9. An car rental company charges a flat fee of \$75 plus \$0.60 per mile for the rental of a car.
   a. Write how much the company charges, *C*, as a function of number of miles driven, *m*.
   b. How much would you pay if you drove 750 miles?
   c. You have \$1095 budgeted for the rental. How many miles can you drive?

10. Given the following graph of $f(x)$, tell whether $f(x)$, $f'(x)$, and $f''(x)$ are positive, negative, or zero at the indicated points. You can use symbols +, -, or 0 instead of the words.

	$f(x)$	$f'(x)$	$f''(x)$
A			
B			
C			
D			
E