MAT 220 – Calculus I Name_____

Bohart

Quiz #1

1. Determine the derivatives of each of the following functions.

   a. $f(x) = 5x^3 - x$ b. $g(x) = \sqrt[3]{x}$

2. Let $f(x) = 5x^2 - 3x + 18$. **Use the limit definition of the derivative** to show that $f'(x) = 10x - 3$. (Note: You are being graded on notation, so write out each step clearly).

3. The following is partial table of values for a function P(t).

x	0	1	2	3	4	5
g(x)	11	10	7	2	-5	-14

   a. Use the central difference quotient to estimate g'(2)

   b. Use the central difference quotient to estimate g'(1.5).

4. Determine the equation of the line tangent to the graph of $f(x)=\frac{4}{x^2}$ at the point x = 2.

5. The temperature in degrees Fahrenheit of a cup of coffee is given by *f(t)* where *t* is the minutes since the coffee was poured into the cup. Give the meaning of the following statements in plain English (including all appropriate units).

   a. $f(5)=90$

   b. $f'(5)=-3$

   c. $f'(5)<0$ and $f''(5)>0$

6. Sketch a possible graph of f(x)

$f(x)$ is continuous and differentiable $(-\infty,\infty)$

$f'(x)>0 \qquad -4<x<6$

$f'(x)<0 \qquad x<-4 \text{ or } x>6$

$f''(x)>0 \qquad x<1$

$f''(x)<0 \qquad x>1$