EXAM 2 - MATH 112 YOUR NAME:

Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Use the limit definition of the derivative to find the slope of the tangent line to the graph of $f(x) = \sqrt{5x+1}$ at x = 7.

2. Find the equation of the tangent line to the graph of $f(x) = \left(\frac{x}{x-1}\right)^3$ at x = 2.

3. Compute the derivative of the function

$$f(x) = \left[\left(x^7 + 5x^3 + 15 \right)^3 - \frac{1}{\sqrt{x}} \right]^5.$$

- 4. A company analyst calculates that when a store charges x for a chocolate bar, then the number of bars sold are $S(x) = \frac{1000}{x+1}$.
 - (a) How many bars are sold when the price is \$2?

(b) Find the rate of change of the quantity sold when the store charges \$4 apiece and interpret your answer.

- 5. Suppose that the distance s in meters covered by a moving object in t seconds is given by $s(t) = \frac{1}{1+t^2}$.
 - (a) Find the velocity of the object at t = 1 seconds.

(b) Find the moment at which the object will have no acceleration.