SMTH 122 Practice Test I

For Larson text

On the actual test, you will be required to write in complete sentences on your scratch paper; write your final answers on the test paper and turn in both the test and your scratch. If your answers are wrong and I cannot read your scratch work, I will not be able to give you partial credit.

1. If the cost of producing x items is C(x) = 6x + 500,000 and the revenue from the sale of x items is R(x) = 35x, what is the number of items that must be made and sold to break even? _____. What will be the production cost at that point? _____.

2. A company reimburses its sales representatives at $150 per day for meals and lodging, plus $0.34 per mile driven. Write a linear function that gives the daily cost C in terms of the number x of miles driven. _____ If the cost of Jorge's road trip on last Thursday was $274.78, how many miles did he drive? _____

3. Find and simplify the difference quotient of $y = x^3 - x$. Remember that the difference quotient is the slope of the secant between points on the graph of y associated with x and x+h:

$\frac{f(x+h) - f(x)}{h}$ = _____

4. Find the following: $\lim_{x \to 2} \frac{2-x}{x^2-4}$ = _____.

5. Use the limit definition and show all steps to find the derivative of $f(x) = x^2 - 3x$. Show **all** your work **here**:

<For problems of this type, space will be provided on the test sheet. The method you use and the clarity with which you write will be graded.>

6. Find the value of the derivative of $f(x) = (2x^2 - 3x)^2$ at x=2. Ans: _____

7. If the cost of producing x units of an item is C(x) = $400 + \sqrt{5x}$, what is the marginal cost function?

_____

8. Find the value of the derivative of $h(x) = \frac{x^2}{x+3}$ at the point (-1, ½):

_____

9. If $f(x) = 3x\sqrt{x^2+1}$, find $f'(x)$: _____

10. Insurance premiums increase rapidly for a certain small company's policy if workers incur several severe injuries in a six month period. Here's some historical data:

x (number of claims in the period):	1	5	6	10	15
C (premium at the next billing):	9	33	80	1008	6533

The data appear to fit a fourth degree model (a quartic). Find the function that predicts premiums from the number of claims and then find the marginal cost/claim for 7 claims.

Function: _____ C'(7)=_____