AP CALCULUS AB HOMEWORK #8

5.2. Mean Value Theorem

Section 5.2 Exercises, pg. 208
1, 4, 8, 11

Supplemental Problems
1

5.4. Optimization

Section 5.4 Exercises, pg. 231
2^1, 5^1, 9^1, 23^1

Supplemental Problems
2

5.5. Linearization and Differentials

Section 5.5 Exercises, pg. 247
1^2, 5^2, 13^3, 16^3, 17^3, 25, 26

5.6. Related Rates

Section 5.6 Exercises, pg. 257
5, 9(a,b,c), 13, 16, 20

Supplemental Problems
3

Notes:

1. Use the second derivative test to verify the extremum.

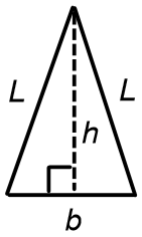
2. Express the accuracy of the approximation as a percent relative error.

3. Also calculate the percent relative error of the approximation.

Supplemental Problems:

1) For $f(x) = x^3 - 9x^2 + 18x + 12$ on $x \in [-2, 10]$, find the values of $c \in [-2, 10]$ which are guaranteed to exist via the Mean Value Theorem.

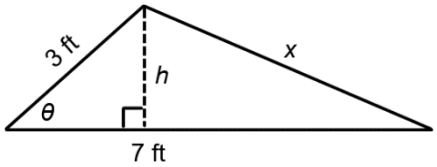
2) The isosceles triangle shown has a perimeter of 30 ft.



Find the values of b and L such that the area A of the triangle is maximized. Also find the maximum value of A. Verify the maximum with the second derivative test. What can you say about the shape which has the maximum area?

Hint: Express b and h in terms of L so that $A = A(L)$.

3) For the triangle shown,



when the area $A = 7\text{ft}^2$ and $\frac{dA}{dt} = 0.5\ \text{ft}^2/\text{min}$, find

a) $\frac{d\theta}{dt}$ in both rad/min and deg/min,

b) and $\frac{dx}{dt}$.