Homework Assignment for Week 04

Assigned Oct 06, 2011.

1. Section 3.5: As time permits, pick among problems 51-70 and practice until you are fluent with differentiation.

2. Section 3.6: problems 21, 25, 33, 37, 43, 58.

3. The error formula for linear approximation is not mentioned explicitly in the textbook (not until Chap 9, Taylors Theorem). Just memorize it for now:

$$f(x) - L(x, x_0) = \frac{1}{2} f''(\xi)(x - x_0)^2$$

   where ξ lies between x and x_0. As a consequence, we have an error bound

$$|f(x) - L(x, x_0)| \leq \frac{1}{2} \left(\max_{\xi \text{ between } x \text{ and } x_0} |f''(\xi)| \right) (x - x_0)^2$$

4. Section 3.7: problems 9, 10, 17, 20 (also give an error estimate for (b)), 35, 45, 51.

5. Review equations (10), (11) on page 184. Try deriving them. Then read Appendix 3 (proof of chain rule).

6. Section 3.8: problems 13, 22. Just write the formula of Newton's iteration. Need not get the numerical values.

7. Chap 3: problem 90. Do the same for $\frac{1}{1+\sin(2x)}$.