Homework Assignment for Week 04

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

2. 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

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

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

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

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