# Homework Assignment for Chapter 02

1. Section 2.2: 41, 77, 87 (find the limit and need not plot it).

2. Section 2.3: problems 35, 49, 53.

3. Section 2.3: Read the $\varepsilon - \delta$ definition of 'Showing $L$ is not a limit' in p84 and review the decomposition steps shown in class that leads to this definition. Then do problem 57(b).

4. Can the following be the definition for $\lim_{x \to c} f(x) \neq L$? Explain.

   For any $\delta > 0$, there exists an $\epsilon_0 > 0$ and an $x_0 \in (c - \delta, c) \cup (c, c + \delta)$ such that $|f(x_0) - L| \geq \epsilon_0$.

5. Section 2.4: Problems 26, 34, 42, 48.

6. Chap 2: Problems 25 (Hint: $1 - \cos x = 2 \sin^2 \frac{x}{2}$), 26 on page 121.

7. Section 2.5: problems 64, 67, 77 (Need not graph it).

8. Section 2.6: problems 92, 93, 100 (need not graph it, just find all horizontal, vertical and oblique asymptotes).

9. Read Definition of the limits in p87, p104, p110 and p116. Then verify the following statements using formal definition of limits:

   **a.**
   $$\lim_{x \to 0^+} \frac{1}{x} = \infty$$

   **b.**
   $$\lim_{x \to \infty} -x^2 = -\infty$$