Homework Assignment 1
Due on Wed. 9/23

Exercise 1: Let A, B, C be three sets. Prove the following two statements.

i $A \backslash (B \cup C) = (A \backslash B) \cap (A \backslash C)$.

ii If $A \cup B = A \cup C$ and $A \cap B = A \cap C$, then $B = C$.

Exercise 2: Use the definition of limit to show that

$$\lim_{x \to 3} \frac{x+3}{2x-4} = 3$$

Exercise 3: Prove or disprove the following statements.

i If $\lim_{x \to c} f(x)$ does not exist and $\lim_{x \to c} g(x)$ exists, then $\lim_{x \to c} [f(x) - g(x)]$ dose not exist.

ii If $\lim_{x \to c} [f(x)g(x)]$ exists and $\lim_{x \to c} f(x)$ exists, then $\lim_{x \to c} g(x)$ exists.

iii If $\lim_{x \to c} f(x) = 0$, then $\lim_{x \to c} f(x)g(x) = 0$.

iv If $\lim_{x \to c} f(x) = 0$ and $\lim_{x \to c} \dfrac{f(x)}{g(x)} = L \neq 0$, then $\lim_{x \to c} g(x) = 0$.

Exercise 4: Do the following exercise problems in the textbook by J. Stewart,
Sec 1.3: 11, 25, 38, 47, 63, 69, 70, 71
Sec 1.5: 7, 12, 16
Sec 1.6: 13, 22, 25
Sec 1.7: 4, 37, 39