Section 1: Please complete the following problems and turn them in at the beginning of class on Friday.

Problem 1: Let $A = \{x \in \mathbb{Z} : x$ is a multiple of 3\}, $B = \{1,3\}$, and $C = \{x \in \mathbb{Z} : x$ is a multiple of 6\}.

(1) List the elements of $A$.

(2) Is $B \subseteq A$? Explain your answer.

(3) Is $C \subseteq A$? Explain your answer.

Problem 2: Give examples of three sets $A$, $B$, and $C$ for each of the following:

(1) $A \subset B \subseteq C$

(2) $A \in B$ and $B \in C$

(3) $A \cap B = C$

Problem 3: 1.18 from our book.

Problem 4: Find $\mathcal{P}(A)$ and $|\mathcal{P}(A)|$ for each of the following:

(1) $A = \{1,2,3,4\}$

(2) $A = \{\emptyset, \emptyset\}$

Problem 5: Give examples of two sets $A$ and $B$ such that $|A \cap B| = |A \setminus B| = 3$ and $|B \setminus A| = 2$. Draw the accompanying Venn diagram.

Problem 6: Let $A_n = \{n, n + 1, n + 2\}$. Determine the following:

(1) $\bigcup_{n=1}^{\infty} A_n$

(2) $\bigcap_{n=k}^{k+2} A_n$

Problem 7: Look at 1.56 from our book. Show that any collection $\mathcal{C}$ of subsets of $A$ satisfying Definition 1 satisfies Definition 2 and that any collection $\mathcal{C}$ of subsets of $A$ satisfying Definition 2 satisfies Definition 1.
Problem 8: Let $A = \{1, 2, 3\}$ and $B = \{\emptyset, 0\}$. Find $A \times B$.

Problem 9: 2.2 from our book.

Problem 10: State the negation of each of the following statements.

   (1) $\pi$ is a rational number.

   (2) The real number $x$ is at least 10.

   (3) Two sides of the triangle have the same length.

Section 2: Your quiz on Friday will be taken from the problems in this section.

1.2 (a)(b), 1.10, 1.20, 1.32, 1.46 (a) – (c), 1.60, 2.3, 2.12

Section 3: These are extra practice problems.

1.4, 1.14, 1.22, 1.30, 1.40 (a), 1.48, 1.52, 2.4, 2.13