1. (5.1) Let $U = \{1, 2, 3, 4, 5\}, R = \{1, 3, 5\}, S = \{3, 4, 5\}$, and $T = \{3, 4\}$.

List the elements of the following sets:

(a) $R \cap S \cap T$
(b) $R \cap S \cap T'$
(c) $R \cap S' \cap T$
(d) $R' \cap T$
(e) $R \cup S$
(f) $(R \cup S) \cap (R \cup T')$
(g) $(S \cup T)'$
(h) $S' \cup T'$
(i) $(R \cap S) \cup (R \cap T)$

2. (5.2) Draw a Venn diagram and shade the area representing $A' \cap B$

3. (5.2) Draw a Venn diagram and shade the area represented by: $(A \cup B) \cap C'$

4. (5.3) A survey of employees in a certain company revealed that 300 people subscribe to Newsweek, 200 people to Time and 50 subscribe to both. How many people subscribe to at least one of the publications?

5. (5.3) Of the 127 applicants for a job that requires fluency in French or Spanish, 74 indicated that they are fluent in French and 15 indicated that they are fluent in both. How many applicants are fluent in Spanish?

6. (5.3) A survey of 120 students showed the following results: 48 take English, 49 take Math, 38 take Science, 17 take both English and Math, 15 take both English and Science, 18 take both Math and Science, and 8 take all three. Draw a Venn Diagram illustrating the situation and then find the number of students:

(a) who don’t take any of the three courses.
(b) who take exactly one of the three courses.
7. (5.3) A merchant surveyed 350 people to determine from where they found out about an upcoming sale. The results were as follows: 160 from the Internet, 110 from television, 140 from newspapers, 70 from the Internet and newspapers, 30 from the Internet and television only, 40 from television and newspapers and 25 from all three sources.

(a) How many people learned of the sale from newspapers or the Internet, but not both?
(b) How many people learned of the sale only from newspapers?

8. (5.4) A license plate consists of 2 numbers followed by 3 letters. The letters “O” and “I” are not used. Repetition of letters or numbers is not allowed. How many license plates are possible?

9. (5.4) How many four-letter words (including nonsense words) can be made from the letters b, c, d, e, f, g, h, i, for each of the following conditions?

(a) Letters can be repeated.
(b) Letters cannot be repeated.
(c) Words must begin with b, and repetitions are allowed.
(d) Words must end with a vowel, and repetitions are not allowed.

10. (5.6) How many five-digit zip codes contain exactly one zero?

11. (5.5) In how many ways can 5 people be chosen from a pool of 12 people to form a committee?

12. (5.5) How many ways can 5 books be arranged on a shelf if there are 11 books to choose from?

13. (5.6) Mrs. Smith has twenty children in her class. In how many ways can she choose 4 members and a captain to form a 5 member quiz team?

14. (5.5) If a coin is tossed 6 times in how many ways can you get exactly 4 heads and 2 tails?

15. (5.6) In how many ways can five mathematics books and four novels be placed on a bookshelf if the mathematics books must be together?
16. (5.6) A committee has four male and five female members. In how many ways can a subcommittee consisting of two males and two females be selected?

17. (5.6) A neighborhood club has 8 girls and 6 boys. A basketball team of 5 players is to be selected.
   
   (a) In how many ways can the selection be made?
   (b) In how many ways can the selection be made so that the team consists of both boys and girls?

18. (5.6) A package contains 100 fuses, of which 10 are defective. A sample of 5 fuses is selected at random.
   
   (a) How many different samples are there?
   (b) How many of the samples contain 2 defective fuses?
   (c) How many of the samples contain at least 1 defective fuse?

19. (5.7) In how many ways can a selection of at most five appetizers be made from a menu containing seven appetizers?

20. (5.7) A salad bar offers a base of lettuce to which tomatoes, chickpeas, beets, pinto beans, olives, and green peppers can be added. Five salad dressings are available. How many different salads are possible? (Assume that each salad contains at least lettuce and at most one salad dressing.)

21. (5.7) How many different tips could you leave in a restaurant if you had a nickel, a dime, a quarter, a half-dollar, and a dollar coin?

22. (5.8) A crew consists of 15 construction workers. A job requires 6 welders, 5 concrete workers, and 4 heavy equipment operators. In how many ways can the 15 workers be assigned to the required tasks?