1. In a psychology class of 60 students, there are 15 males and 45 females. Of the 15 men, only 5 are freshmen. Of the 45 women, 20 are freshmen. If you randomly sample an individual from this class,
   a. What is the probability of obtaining a female?
   b. What is the probability of obtaining a freshman?
   c. What is the probability of obtaining a male freshman?

2. A jar contains 10 black marbles and 20 white marbles.
   a. If you randomly select a marble from the jar, what is the probability that you will get a white marble?
   b. If you are selecting a random sample of $n = 3$ marbles and the first 2 marbles are both white, what is the probability that the third marble will be black?

7. For a normal distribution, find the z-score location of a vertical line that would separate the distribution into two parts as specified in each of the following:
   a. Where do you draw a line that separates the top 40% (right side) from the bottom 60% (left side)?
   b. Where do you draw a line that separates the top 10% (right side) from the bottom 90% (left side)?
   c. Where do you draw a line that separates the top 80% (right side) from the bottom 20% (left side)?

8. A normal distribution has $\mu = 50$ and $\sigma = 10$. For each of the following locations (X values), draw a sketch of the distribution, and draw a vertical line through the distribution at the location specified by the score. Then find the proportion of the distribution on each side of the line.
   a. $X = 55$
   b. $X = 50$
   c. $X = 48$
   d. $X = 40$

12. For a normal distribution with a mean of $\mu = 80$ and $\sigma = 12$,
    a. What is the probability of randomly selecting a score greater than 83?
    b. What is the probability of randomly selecting a score greater than 74?
    c. What is the probability of randomly selecting a score less than 92?
    d. What is the probability of randomly selecting a score less than 62?

14. A normal distribution has a mean of 120 and a standard deviation of 20. For this distribution,
    a. What score separates the top 40% (highest scores) from the rest?
    b. What score corresponds to the 90th percentile?
    c. What range of scores would form the middle 60% of this distribution?

16. A normal distribution has a mean of 80 and a standard deviation of 10. For this distribution, find each of the following probability values:
    a. $p(X > 75) = ?$ d. $p(65 < X < 95) = ?$
    b. $p(X < 65) = ?$ e. $p(84 < X < 90)?$
    c. $p(X < 100) = ?$

18. A normal distribution has a mean of $\mu = 120$ with $\sigma = 15$. Find the following values:
    a. The 15th percentile
    b. The 88th percentile
    c. The percentile rank for $X = 142$
    d. The percentile rank for $X = 102$
    e. The percentile rank for $X = 120$
    f. The semi-interquartile range