Assignment

Write
Describe how to determine a percent from a *z*-score table.

Remember
A *z*-score is a number that describes a specific data value's distance from the mean in terms of standard deviation units. A percentile is a data value for which a certain percent of the data is below the data value.

Practice
The birth weights of African lions are normally distributed. The average birth weight of an African lion is 3.6 pounds with a standard deviation of 0.4 pound.
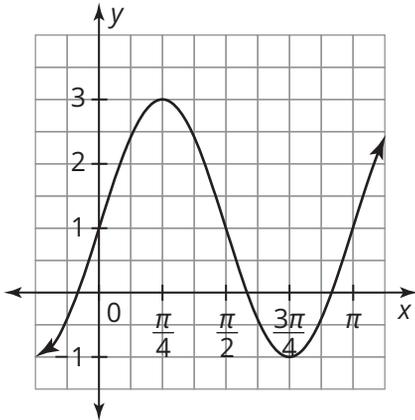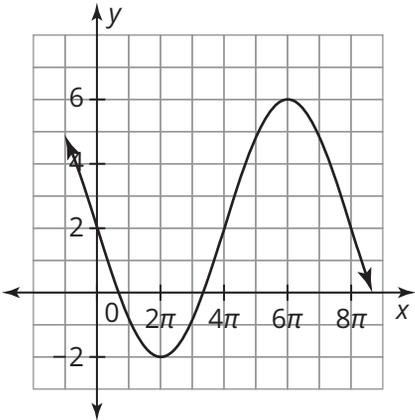
1. What percent of newborn African lions weigh less than 3 pounds? Weigh more than 3.8 pounds? Weigh between 2.7 and 3.7 pounds?
2. What is the birth weight of a lion cub in the 80th percentile? In the 10th percentile? In the 97th percentile?
3. A lioness gives birth to two cubs. One cub is in the 47th percentile and the other is in the 62nd percentile. Determine the difference in the cubs' weights.
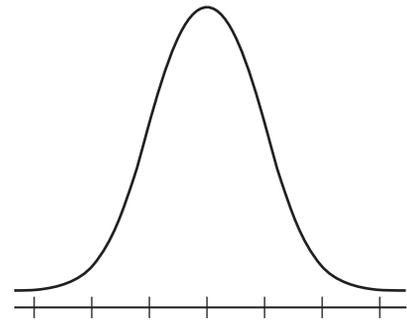
Stretch
The birth weights of African lions are normally distributed. The average birth weight of an African lion is 3.6 pounds with a standard deviation of 0.4 pound.

1. There is concern in the biology community about underweight and overweight newborn African lions, specifically those less than 2.6 pounds and those more than 4.6 pounds at birth. What is the percent of newborn lions in those ranges?
2. A more recent study of the birth weights of African lions suggest that the average birth weight is 3.6 pounds with a standard deviation of 0.5 pound. Without doing any calculations, determine whether the percent of newborn lions weigh less than 2.6 pounds or more than 4.6 pounds will increase or decrease. Explain your reasoning.
3. Determine the percent of newborn lions that weigh less than 2.6 pounds or more than 4.6 pounds in the population with a mean of 3.6 pounds and a standard deviation of 0.5 pound. Did it match your result from part b)?

Review

1. A researcher recorded the resting heart rates of a sample of men aged 40-45. The average resting heart rate was 72 beats per minute and the standard deviation was 3.5 beats per minute. The resting heart rates follow a normal distribution.

   a. Sketch and label a normal curve. Include 3 standard deviations above and below the mean.

   b. Determine the percent of men who have resting heart rates between 2 standard deviations below the mean and 1 standard deviation above the mean.

   c. Approximately what percent of men had resting heart rates less than 65 beats per minute?

Resting Heart Rates
(Beats Per Minute)

2. The equation $d(t) = 11 \cos\left(\frac{8\pi}{5}t\right)$ can be used to model the distance the pendulum of a clock is in inches from its center position as a function of time. The pendulum is released from its rightmost position. Assume that the right of center is a positive distance and the left of center is a negative distance.

   a. Determine the pendulum's distance from the center at 3.5 seconds.

   b. Determine when the pendulum is 7 inches to the left of center.

3. Write a sine function for each graph.

   a.

   b.