

Lesson #27 · Topic 2G · Practice

Name _____

1. For a standardized normal distribution, find the area described by each of the following inequalities:

a. $z < -0.80$

b. $-1.93 < z < 1.38$

c. $z > 2.26$

d. $z \geq 2.26$

2. The scoring of IQ exams is set so that the distribution of scores for the general population is approximately normal with a mean 100 and the standard deviation is 15.
- Draw the normal distribution and label the mean, as well as one, two, and three standard deviations from the mean.
 - How many standards deviation away from the mean and in what direction is an IQ score of 80?
 - What proportion of the population scores 80 or below?
 - An individual scoring 140 or above is considered to have a “genius-level” IQ. What proportion of the population scores a “genius-level” IQ?

3. Researchers measured the resting heart rate of over 92,000 individuals using wearable devices over a two-year period. The results of the study showed the resting heart rates were approximately normal with a mean of 63 beats per minute (bpm) and a standard deviation of 3.03 bpm.
- What proportion of the individuals in the study have a resting heart rate below 58 bpm?
 - What proportion of the individuals in the study have a resting heart rate above 66 bpm?
 - What proportion of the individuals in the study have a resting heart rate between 58 and 66 bpm?
 - Athletes often have lower than average resting heart rates. What is the resting heart rate for an athlete who is at the 10th percentile.
4. A sandwich shop is known for their fast delivery. If a delivery takes longer than 60 minutes, the order is free for the customer. The distribution of delivery times for the shop are approximately normal with a mean time of 40 minutes and a standard deviation of 8 minutes.
- What proportion of delivery times will be 30 minutes or less?
 - What proportion of the deliveries are expected to be free because of the 60-minute time limit?
 - The manager of the sandwich shop needs to predict the expected total cost for the free deliveries for the next month. Based on previous months, the manager knows that the shop will have about 600 deliveries and the average delivery order cost is \$22. How much should the manager expect the free deliveries to cost? Show your work.

5. The mean home value in Atlanta, Georgia is \$386,122 with a standard deviation of \$221,000. A small home valued at \$120,000 is at the 20th percentile.
- Interpret the percentile for the small home.
 - Calculate and interpret the z -score for the small home.
 - Is it reasonable to assume that the distribution of Atlanta home values is approximately normal? Explain.
6. The distribution of final exam scores in a college chemistry class is skewed to the left with a mean of 88 and a standard deviation of 12.
- Calculate and interpret the z -score for Paige who scored a 95 on the exam.
 - If possible, calculate the proportion of students in this class that scored less than Paige.

7. The weights of dimes are approximately normally distributed with a standard deviation of 0.02 grams. A dime that weighs 2.263 grams is at the 25th percentile. What is the mean weight, in grams, for all dimes?
- A) 2.268
- B) 2.276
- C) 2.513
- D) 2.829
8. Although cans of soda are listed as holding 12 ounces, the machine that fills the cans is set to fill the cans with a mean of 12.05 ounces and a standard deviation of 0.02 ounces. Assuming the amount of soda in the cans is normally distributed, which expression represents the amount of soda in a can that is at the 90th percentile of the distribution?
- A) $-1.282(0.02) + 12.05$
- B) $-0.1(0.02) + 12.05$
- C) $0.1(0.02) + 12.05$
- D) $1.282(0.02) + 12.05$