E Chapter 3 Exercises

Respond thoughtfully to the following exercises.

1. Four friends went out to eat one evening, and the mean price of their dinners was $10.54. If the prices of the first three meals were $9.62, $11.59, and $10.03, what was the cost of the fourth meal?
2. Suppose that a list of company CEOs is compiled, and 37% are over the age of 45. True or false: Q_3 must be greater than 45.
3. Suppose that 200 employees at a major theme park are surveyed, and 54% are under the age of 25.
   a. True or false: Of those surveyed, the mean age must be under 25.
   b. True or false: Of those surveyed, the median age must be under 25.
4. Give one example of a data set with a large variation and one example of a data set with a small variation.
5. The mean grade for Test 2 in Marquetta's biology class is 73, and the standard deviation is 8 points. If the standard score for Marquetta's test is 1.25, what is her grade?
6. Neikia wants to determine the average amount of money moviegoers typically spend on snacks at the theater. He surveys 150 people leaving the theater one evening, and finds that 79 did not spend any money on refreshments. The maximum amount spent was $22.50.
   a. What is the largest possible value for the mean?
   b. What is the median amount spent on refreshments?
7. Suppose that Julie's height has a standard score of 0.44. True or false: Julie is taller than average.
8. The mean cost of individual health insurance in one region of the country is $421 per month with a standard deviation of $78. Of those in the region who have individual health insurance, approximately what percentage spend between $343 and $499 on their insurance each month? Assume that individual health insurance costs in the region have a bell-shaped distribution.
9. The mean upload speed for a particular Internet provider is 500 KBps with a standard deviation of 60 KBps. Use Chebyshev's Theorem to estimate the percentage of customers who should be able to upload data at speeds between 320 and 680 KBps.
10. True or false: If the standard deviation of a data set is zero, then all of the values in the set must be the same number.

11. Calculate the sample standard deviation and sample variance of the following monthly prices of cellular phone plans.

$44.99, $59.99, $34.49, $89.99, $54.99, $65.99, $49.99

12. Find the GPA of a student who received the following grades. Note that an A is equivalent to a 4.0, a B is equivalent to a 3.0, and a C is equivalent to a 2.0.

Biology II (3-hour class): B

Biology II Lab (1-hour class): A

English 212 (3-hour class): B

German 101 (3-hour class): C

Precalculus (3-hour class): C

Scuba Diving (2-hour class): A

13. Find the approximate mean of the following data, which represent the number of debit card purchases in one month for a random sample of college students.

Number of Debit Card Purchases in One Month

Class	Frequency
0–7	8
8–15	3
16–23	9
24–31	5

14. If we know that an ACT score was 21 and that score was in the 67th percentile, can we determine how many students were in the sample? Why or why not?

15. The following numbers represent the numbers from a five-number summary for the number of child abuse cases reported per county during a one-week period. Unfortunately, the numbers have been shuffled and are no longer in the right order. Can you still determine which number is the first quartile, Q_1? Explain your answer.

14, 17.5, 8, 12.5, 21

16. Maeve wants to calculate the average final exam grade of the students that she teaches. Her first class, which had 42 students in it, averaged an 88 on their final exam. Her second class of 55 students averaged an 81 and her last class of 48 students averaged an 84. What is the average final exam grade of her students?