1. Jorge’s score on Exam 1 in his statistics class was at the 64th percentile of the scores for all students. His score falls
(a) between the minimum and the first quartile.
(b) between the first quartile and the median.
(c) between the median and the third quartile.
(d) between the third quartile and the maximum.
(e) at the mean score for all students.

2. Scores on the ACT college entrance exam follow a bell-shaped distribution with mean 18 and standard deviation 6. Wayne’s standardized score on the ACT was \(-0.7\). What was Wayne’s actual ACT score?
(a) 4.2
(b) \(-4.2\)
(c) 13.8
(d) 17.3
(e) 22.2

3. George has an average bowling score of 180 and bowls in a league where the average for all bowlers is 150 and the standard deviation is 20. Bill has an average bowling score of 190 and bowls in a league where the average is 160 and the standard deviation is 15. Who ranks higher in his own league, George or Bill?
(a) Bill, because his 190 is higher than George’s 180.
(b) Bill, because his standardized score is higher than George’s.
(c) Bill and George have the same rank in their leagues, because both are 30 pins above the mean.
(d) George, because his standardized score is higher than Bill’s.
(e) George, because the standard deviation of bowling scores is higher in his league.

4. If 30 is added to every observation in a data set, the only one of the following that is not changed is
(a) the mean.
(b) the 75th percentile.
(c) the median.
(d) the standard deviation.
(e) the minimum.
5. If every observation in a data set is multiplied by 10, the only one of the following that is not multiplied by 10 is
(a) the mean. 
(b) the median. 
(c) the IQR. 
(d) the standard deviation. 
(e) the variance.

6. Which of the following is least likely to have a nearly Normal distribution?
(a) Heights of all female students taking STAT 001 at State Tech.
(b) IQ scores of all students taking STAT 001 at State Tech.
(c) SAT Math scores of all students taking STAT 001 at State Tech.
(d) Family incomes of all students taking STAT 001 at State Tech.
(e) All of (a)–(d) will be approximately Normal.

Questions 7 to 9 refer to the following setting. The weights of laboratory cockroaches follow a Normal distribution with mean 80 grams and standard deviation 2 grams. The figure below is the Normal curve for this distribution of weights.

7. Point C on this Normal curve corresponds to
(a) 84 grams. 
(b) 82 grams. 
(c) 78 grams. 
(d) 76 grams. 
(e) 74 grams.
8. About what percent of the cockroaches have weights between 76 and 84 grams?
(a) 99.7%  
(b) 95%
(c) 68%  
(d) 47.5%
(e) 34%

9. About what percent of the cockroaches have weights less than 78 grams?
(a) 34%
(b) 32%
(c) 16%
(d) 2.5%
(e) none of these

10. The proportion of observations from a standard Normal distribution with values less than 1.15 is
(a) 0.1251.  
(b) 0.8531.
(c) 0.8749.  
(d) 0.8944
(e) none of these.

11. The proportion of observations from a standard Normal distribution with values larger than −0.75 is
(a) 0.2266.  
(b) 0.7422.
(c) 0.7734.  
(d) 0.8023.
(e) none of these

12. Many professional schools require applicants to take a standardized test. Suppose that 1000 students take such a test. Several weeks after the test, Pete receives his score report: he got a 63, which placed him at the 73rd percentile. This means that
(a) Pete’s score was below the median.
(b) Pete did worse than about 63% of the test takers.
(c) Pete did worse than about 73% of the test takers.
(d) Pete did better than about 63% of the test takers.
(e) Pete did better than about 73% of the test takers.
13. For the Normal distribution shown, the standard deviation is closest to

(a) 0  
(b) 1  
(c) 2  
(d) 4

14. Rainwater was collected in water collectors at 30 different sites near an industrial complex, and the amount of acidity (pH level) was measured. The mean and standard deviation of the values are 4.60 and 1.10, respectively. When the pH meter was recalibrated back at the laboratory, it was found to be in error. The error can be corrected by adding 0.1 pH units to all of the values and then multiplying the result by 1.2. The mean and standard deviation of the corrected pH measurements are

(a) 5.64, 1.44  
(b) 5.64, 1.32  
(c) 5.40, 1.44  
(d) 5.40, 1.32  
(e) 5.64, 1.20

15. The figure shows a cumulative relative frequency graph of the number of ounces of alcohol consumed per week in a sample of 150 adults. About what percent of these adults consume between 4 and 8 ounces per week?
16. The average yearly snowfall in Chillyville is Normally distributed with a mean of 55 inches. If the snowfall in Chillyville exceeds 60 inches in 15% of the years, what is the standard deviation?

- (a) 4.83 inches
- (b) 5.18 inches
- (c) 6.04 inches
- (d) 8.93 inches
- (e) The standard deviation cannot be computed from the given information.

17. The figure shown is the density curve of a distribution. Five of the seven points marked on the density curve make up the five-number summary for this distribution. Which two points are not part of the five-number summary?

- (a) B and E
- (b) C and F
- (c) C and E
- (d) B and F
- (e) A and G

18. If the heights of American men follow a Normal distribution, and 99.7% have heights between 5’0” and 7’0”, what is your estimate of the standard deviation of the height of American men?

- (a) 1”
- (b) 3”
- (c) 4”
- (d) 6”
- (e) 12”
19. Which of the following is not correct about a standard Normal distribution?

(a) The proportion of scores that satisfy \( 0 < z < 1.5 \) is 0.4332.

(b) The proportion of scores that satisfy \( z < -1.0 \) is 0.1587.

(c) The proportion of scores that satisfy \( z > 2.0 \) is 0.0228.

(d) The proportion of scores that satisfy \( z < 1.5 \) is 0.9332.

(e) The proportion of scores that satisfy \( z > -3.0 \) is 0.9938.

Questions 20 and 21 refer to the following setting. Until the scale was changed in 1995, SAT scores were based on a scale set many years ago. For Math scores, the mean under the old scale in the 1990s was 470 and the standard deviation was 110. In 2009, the mean was 515 and the standard deviation was 116.

20. What is the standardized score (z-score) for a student who scored 500 on the old SAT scale?

(a) −30

(b) −0.27

(c) 0.13

(d) 0.27

21. Jane took the SAT in 1994 and scored 500. Her sister Colleen took the SAT in 2009 and scored 530. Who did better on the exam, and how can you tell?

(a) Colleen—she scored 30 points higher than Jane.

(b) Colleen—her standardized score is higher than Jane’s.

(c) Jane—her standardized score is higher than Colleen’s.

(d) Jane—the standard deviation was bigger in 2009.

(e) The two sisters did equally well—their z-scores are the same.