5 REVIEW EXERCISES

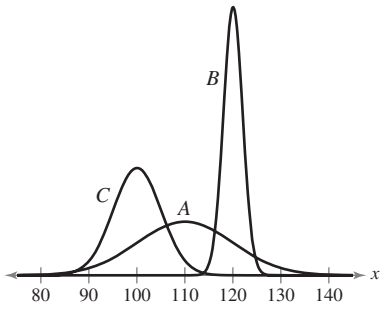
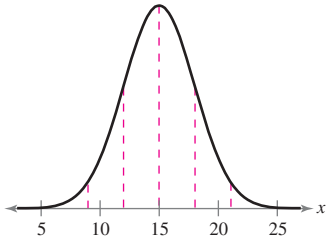


FIGURE FOR EXERCISES 3 AND 4

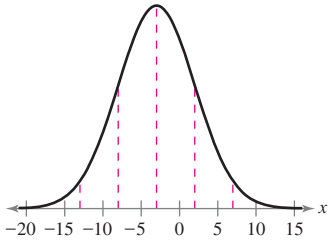
SECTION 5.1

In Exercises 1 and 2, use the graph to estimate μ and σ.

1.



2.



In Exercises 3 and 4, use the normal curves shown.

3. Which normal curve has the greatest mean? Explain your reasoning.

4. Which normal curve has the greatest standard deviation? Explain your reasoning.

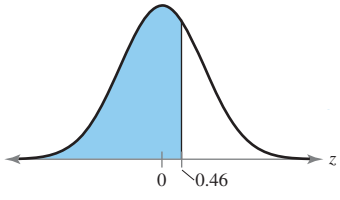
In Exercises 5 and 6, use the following information and standard scores to investigate observations about a normal population. A batch of 2500 resistors is normally distributed, with a mean resistance of 1.5 ohms and a standard deviation of 0.08 ohm. Four resistors are randomly selected and tested. Their resistances are measured at 1.32, 1.54, 1.66, and 1.78 ohms.

5. How many standard deviations from the mean are these observations?

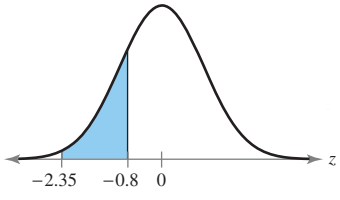
6. Are there any unusual observations?

In Exercises 7 and 8, find the area of the indicated region under the standard normal curve. If convenient, use technology to find the area.

7.



8.



In Exercises 9–20, find the indicated area under the standard normal curve. If convenient, use technology to find the area.

9. To the left of $z = 0.33$

10. To the left of $z = -1.95$

11. To the right of $z = -0.57$

12. To the right of $z = 3.22$

13. To the left of $z = -2.825$

14. To the right of $z = 0.015$

15. Between $z = -1.64$ and the mean

16. Between $z = -1.55$ and $z = 1.04$

17. Between $z = 0.05$ and $z = 1.71$

18. Between $z = -2.68$ and $z = 2.68$

19. To the left of $z = -1.5$ and to the right of $z = 1.5$

20. To the left of $z = 0.64$ and to the right of $z = 3.415$

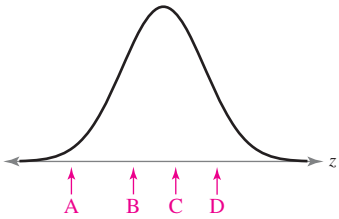


FIGURE FOR EXERCISES 21 AND 22

In Exercises 21 and 22, use the following information. In a recent year, the ACT scores for the reading portion of the test were normally distributed, with a mean of 21.4 and a standard deviation of 6.2. The test scores of four students selected at random are 17, 29, 8, and 23. (Source: ACT, Inc.)

21. Without converting to z-scores, match the values with the letters A, B, C, and D on the given graph.

22. Find the z-score that corresponds to each value and check your answers in Exercise 21. Are any of the values unusual? Explain.

In Exercises 23–28, find the indicated probabilities. If convenient, use technology to find the probability.

23. $P(z < 1.28)$

24. $P(z > -0.74)$

25. $P(-2.15 < z < 1.55)$

26. $P(0.42 < z < 3.15)$

27. $P(z < -2.50 \text{ or } z > 2.50)$

28. $P(z < 0 \text{ or } z > 1.68)$

SECTION 5.2

In Exercises 29–34, assume the random variable x is normally distributed, with mean $\mu = 74$ and standard deviation $\sigma = 8$. Find the indicated probability.

29. $P(x < 84)$

30. $P(x < 55)$

31. $P(x > 80)$

32. $P(x > 71.6)$

33. $P(60 < x < 70)$

34. $P(72 < x < 82)$

In Exercises 35 and 36, find the indicated probabilities.

35. A study found that the mean migration distance of the green turtle was 2200 kilometers and the standard deviation was 625 kilometers. Assuming that the distances are normally distributed, find the probability that a randomly selected green turtle migrates a distance of

(a) less than 1900 kilometers.

(b) between 2000 kilometers and 2500 kilometers.

(c) greater than 2450 kilometers.

(Adapted from Dorling Kindersley Visual Encyclopedia)

36. The world's smallest mammal is the Kitti's hog-nosed bat, with a mean weight of 1.5 grams and a standard deviation of 0.25 gram. Assuming that the weights are normally distributed, find the probability of randomly selecting a bat that weighs

(a) between 1.0 gram and 2.0 grams.

(b) between 1.6 grams and 2.2 grams.

(c) more than 2.2 grams.

(Adapted from Dorling Kindersley Visual Encyclopedia)

37. Can any of the events in Exercise 35 be considered unusual? Explain your reasoning.

38. Can any of the events in Exercise 36 be considered unusual? Explain your reasoning.

SECTION 5.3

In Exercises 39–44, use the Standard Normal Table to find the z-score that corresponds to the given cumulative area or percentile. If the area is not in the table, use the entry closest to the area. If convenient, use technology to find the z-score.