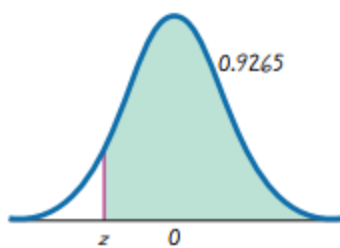
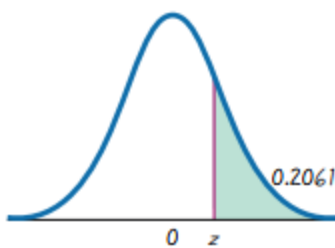


15.



16.



**Standard Normal Distribution.** In Exercises 17–36, assume that a randomly selected subject is given a bone density test. Those test scores are normally distributed with a mean of 0 and a standard deviation of 1. In each case, draw a graph and find the probability of the given scores. If using technology instead of Table A-2, round answers to four decimal places.

17. Less than  $-2.04$ 18. Less than  $-0.19$ 

19. Less than 2.33

20. Less than 1.96

21. Greater than 0.82

22. Greater than 1.82

23. Greater than  $-1.50$ 24. Greater than  $-0.84$ 

25. Between 0.25 and 1.25

26. Between 1.23 and 2.37

27. Between  $-2.75$  and  $-2.00$ 28. Between  $-1.93$  and  $-0.45$ 29. Between  $-2.20$  and 2.5030. Between  $-0.62$  and 1.7831. Between  $-2.11$  and 4.0032. Between  $-3.90$  and 2.00

33. Less than 3.65

34. Greater than  $-3.80$ 

35. Greater than 0

36. Less than 0

**Finding Bone Density Scores.** In Exercises 37–40 assume that a randomly selected subject is given a bone density test. Bone density test scores are normally distributed with a mean of 0 and a standard deviation of 1. In each case, draw a graph, then find the bone density test score corresponding to the given information.

37. Find  $P_{90}$ , the 90th percentile. This is the bone density score separating the bottom 90% from the top 10%.

38. Find  $P_5$ , the 5th percentile. This is the bone density score separating the bottom 5% from the top 95%.

39. If bone density scores in the bottom 2.5% and the top 2.5% are used as cutoff points for levels that are too low or too high, find the two readings that are cutoff values.

40. Find the bone density scores that can be used as cutoff values separating the most extreme 1% of all scores.

**Finding Critical Values.** In Exercises 41–44, find the indicated critical value.

41.  $z_{0.025}$ 42.  $z_{0.01}$ 43.  $z_{0.05}$ 44.  $z_{0.03}$ 

**Basis for the Range Rule of Thumb and the Empirical Rule.** In Exercises 45–48, find the indicated area under the curve of the standard normal distribution, then convert it to a percentage and fill in the blank. The results form the basis for the range rule of thumb and the empirical rule introduced in Section 3-3.

45. About \_\_\_\_\_% of the area is between  $z = -1$  and  $z = 1$  (or within 1 standard deviation of the mean).