Sec. 5.4 – the Normal Distribution

Practice

1. The ages of members of a seniors' lawn bowling club are normally distributed. The mean is 65 years and the standard deviation is 3 years. What percent of the bowlers is in each of the following age groups?

   a) between 59 and 65 years old, inclusive

   c) older than 74 years

   b) between 68 and 74 years old, inclusive

5. A manufacturer offers a warranty on its toasters. The toaster has a mean lifespan of 6.5 years, with a standard deviation of 0.5 years. How long should the toasters be covered by the warranty, if the manufacturer wants to repair no more than 2.5% of the toasters sold?

   Length of warranty: _____ years

Sec. 5.5 – Z-Scores

Practice

1. Determine the z-score for each value of x.

   a) $\bar{x} = 200, \sigma = 25.4, x = 250$

   c) $\bar{x} = 18, \sigma = 2.2, x = 17$

   b) $\bar{x} = 260, \sigma = 12.5, x = 289$

   d) $\bar{x} = 3.2, \sigma = 0.3, x = 2.7$

2. Using a z-score table, determine the percent of data to the left of each z-score in question 1.

3. Determine the percent of data between each pair of z-scores.

   a) $z = +2.12$ and $z = -1.33$

   b) $z = 0.85$ and $z = 1.24$

4. What z-score is required for each situation?

   a) 15% of the data is to the right of the z-score.

   b) 15% of the data is to the left of the z-score.

   c) 57% of the data is above the z-score.

5. A vinyl tile manufacturer produces floor tile that has an average thickness of 5 mm, with a standard deviation of 0.2 mm. For premium floor tiles, the flooring must have a thickness between 4.8 mm and 5.4 mm. What percent, to the nearest whole number, of the total production can be sold as premium tiles? Thicknesses of both types of tiles are assumed normally distributed.

Lesson 5.4, page 122

1. a) 47.5% b) 15.85% c) 0.15%
5. 5 years

Lesson 5.5, page 126

1. a) $z \doteq 1.9685$ b) $z = 2.32$ c) $z \doteq -0.4545$ d) $z \doteq -1.6667$
2. a) 97.64% b) 98.98% c) 32.64% d) 4.80%
3. a) 7.48% b) 9.02%
4. a) $z \doteq 1.04$ b) $z \doteq -1.035$ c) $z \doteq -0.175$
5. $\doteq 82\%$
6. a) $\doteq 94.4\%$ b) 1.3%
7. D.
8. a) accounting: $z = 2.884\ldots$; chemistry: $z = 2.295\ldots$
   b) accounting: over 99.8%; chemistry: 98.9%
   c) accounting