Chapter 5: Review Exercises

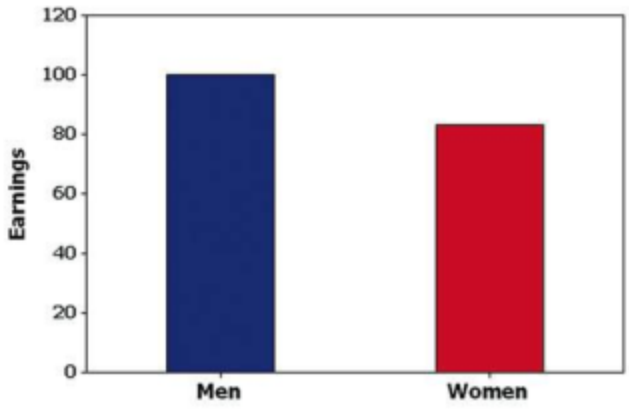
1. 0.047 or 0.0467 2. 0.138
3. $\mu = 240.0$; $\sigma = 12.0$. Range of usual values: 216 to 264. The result of 200 with brown eyes is unusually low.
4. The probability of $P(239 \text{ or fewer}) = 0.484$ is relevant for determining whether 239 is an unusually low number. Because that probability is not very small, it appears that 239 is not an unusually low number of people with brown eyes.
5. Yes, the three requirements are satisfied. There is a numerical random variable x and its values are associated with corresponding probabilities. $\Sigma P(x) = 1.001$, so the sum of the probabilities is 1 when we allow for a small discrepancy due to rounding. Also, each of the probability values is between 0 and 1 inclusive.
6. $\mu = 0.4$; $\sigma = 0.6$. Range of usual values: -0.8 to 1.6 (or 0 to 1.6). Yes, three is an unusually high number of males with tinnitus among four randomly selected males.
7. $\Sigma P(x) = 0.902$, so the sum of the probabilities is not 1 as required. Because the three requirements are not all satisfied, the given information does not describe a probability distribution.
8. \$315,075. Because the offer is well below her expected value, she should continue the game (although the guaranteed prize of \$193,000 had considerable appeal). (She accepted the offer of \$193,000, but she would have won \$500,000 if she continued the game and refused all further offers.)
9. a. 1.2¢ b. 1.2¢ minus cost of stamp.
10. a. $\mu = 0.6$
    b. $P(0) = 0.549$ c. 16.5 days
    d. The expected number of days is 16.5, and that is reasonably close to the actual number of days, which is 18.

Chapter 5: Cumulative Review Exercises

1. a. 24.4 hours b. 24.2 hours c. 4.7 hours
   d. 1.7 hours e. 2.9 hours^2
   f. Usual values: 21.0 hours to 27.8 hours.
   g. No, because none of the times are beyond the range of usual values.
   h. Ratio i. Continuous
   j. The given times come from countries with very different population sizes, so it does not make sense to treat the given times equally. Calculations of statistics should take the different population sizes into account. Also, the sample is very small, and there is no indication that the sample is random.
2. a. 1/10,000 or 0.0001
   b.

x	$P(x)$
−\$1	0.9999
\$4999	0.0001

   c. 0.0365 d. 0.0352 e. −50¢
3. a. 0.282 b. 0.303 c. 0.242 d. 0.297
   e. 0.0792 f. 0.738 g. 0.703
4. Because the vertical scale begins at 60 instead of 0, the difference between the two amounts is exaggerated. The graph makes it appear that men's earnings are roughly twice those of women, but men earn roughly 1.2 times the earnings of women.



5. a. Frequency distribution or frequency table.
   b. Probability distribution.
   c. $\bar{x} = 4.7$. This value is a statistic.
   d. $\mu = 4.5$. This value is a parameter.
   e. The random generation of 1000 digits should have a mean close to $\mu = 4.5$ from part (d). The mean of 4.5 is the mean for the population of all random digits, so samples will have means that tend to center about 4.5.
6. a. 0.0514 b. 0.815
   c. This is a voluntary response (or self-selected) sample. This suggests that the results might not be valid, because those with a strong interest in the topic are more likely to respond.

Chapter 6 Answers

Section 6-2

1. The word "normal" has a special meaning in statistics. It refers to a specific bell-shaped distribution that can be described by Formula 6-1.
3. The mean and standard deviation have the values of $\mu = 0$ and $\sigma = 1$.
5. 0.75 7. 0.4 9. 0.6700
11. 0.6992 (Tech: 0.6993)
13. 1.23 15. −1.45 17. 0.0207
19. 0.9901 21. 0.2061 23. 0.9332
25. 0.2957 (Tech: 0.2956)
27. 0.0198 29. 0.9799 31. 0.9825
33. 0.9999 35. 0.5000 37. 1.28
39. −1.96, 1.96 41. 1.96 43. 1.645
45. 68.26% (Tech: 68.27%)
47. 99.74% (Tech: 99.73%)
49. a. 68.26% (Tech: 68.27%)
    b. 4.56% c. 95.00%
    d. 95.44% (Tech: 95.45%)

Section 6-3

1. a. $\mu = 0$; $\sigma = 1$
   b. The z scores are numbers without units of measurement.
3. The standard normal distribution has a mean of 0 and a standard deviation of 1, but a nonstandard normal distribution has a different value for one or both of those parameters.