5.77 **b.** Using log(y) and log(x), 15.007 parts per million
5.79 **a.** $r = 0$ **b.** For example, adding the point (6, 1) gives $r = 0.510$. (Any y-coordinate greater than 0.973 will work.) **c.** For example, adding the point (6, -1) gives $r = -0.510$. (Any y-coordinate less than -0.973 will work.)

Cumulative Review 5

CR5.3 The peaks in rainfall do seem to be followed by peaks in the number of *E. coli* cases, with rainfall peaks around May 12, May 17, and May 23 followed by peaks in the number of cases on May 17, May 23, and May 28. (The incubation period seems to be more like 5 days than the 3 to 4 days mentioned in the caption.) Thus, the graph does show a close connection between unusually heavy rainfall and the incidence of the infection. The storms may not be *responsible* for the increased illness levels, however, since the graph can only show us association, not causation.
CR5.5 The random pattern in the scatterplot shows there is little relationship between the weight of the mare and the weight of her foal. This is supported by the value of the correlation coefficient.
CR5.7 **b.** Mean = 3.654%, median = 3.35%. **c.** smaller
CR5.9 **b.** Approximately equal **c.** Mean = \$9.459, median = \$9.48 **e.** Mean = \$72.85, median = \$68.61
CR5.11 **a.** $\bar{x} = 2965.2$, $s^2 = 294416.622$, $s = 542.602$, Lower quartile = 2510, Upper quartile = 3112, Interquartile range = 602 **b.** less
CR5.13 **a.** $\bar{x} = 4.93$, Median = 3.6. The mean is greater than the median. This is explained by the fact that the distribution of blood lead levels is positively skewed. **b.** The median blood lead level for the African Americans (3.6) is slightly higher than for the Whites (3.1). Both distributions are positively skewed. There are two outliers in the data set for the African Americans. The distribution for the African Americans shows a greater range than the distribution for the Whites, even disregarding the two outliers.
CR5.15 **a.** Yes **b.** Strong positive linear relationship **c.** Perfect correlation would result in the points lying exactly on some straight line, but not necessarily on the line described.
CR5.17 **a.** 76.64% of the variability in clutch size can be attributed to the approximate linear relationship between snout-vent length and clutch size. **b.** $s_e = 29.250$. This is a typical deviation of an observed clutch size from the clutch size predicted by the least-squares line.
CR5.19 **a.** Yes, the scatterplot shows a strong positive association. **b.** The plot seems to be straight, particularly if you disregard the point with the greatest x value. **c.** This transformation is successful in straightening the plot. Also, unlike the plot in Part (b), the variability of the quantity measured on the vertical axis does not seem to increase as x increases. **d.** No, this transformation has not been successful in producing a linear relationship. There is a clear curve in the plot.

Chapter 6

6.1 A chance experiment is any activity or situation in which there is uncertainty about which of two or more possible outcomes will result.
6.3 **a.** {AA, AM, MA, MM} **c.** **i.** B = {AA, AM, MA} **ii.** C = {AM, MA} **iii.** D = {MM}. D is a simple event. **d.** *B and C* = {AM, MA} *B or C* = {AA, AM, MA}.
6.5 **b.** A^C = {(15, 50), (15, 100), (15, 150), (15, 200)}

$$A \cup B = \begin{Bmatrix} (10, 50), (10, 100), (10, 150), (10, 200), (12, 50) \\ (12, 100), (12, 150), (12, 200), (15, 50), (15, 100) \end{Bmatrix}$$

$$A \cap B = \{(10, 50), (10, 100), (12, 50), (12, 100)\}$$

c. A and C are not disjoint. B and C are disjoint.
6.7 **b.** A = {3, 4, 5} **c.** C = {125, 15, 215, 25, 5}
6.9 **a.** A = {NN, DNN} **b.** B = {DDNN} **c.** The number of outcomes is infinite.
6.13 **a.** {expedited overnight delivery, expedited second-business-day delivery, standard delivery, delivery to the nearest store for customer pick-up} **b.** **i.** 0.2 **ii.** 0.4 **iii.** 0.6
6.15 **a.** {fiction hardcover, fiction paperback, fiction digital, fiction audio, nonfiction hardcover, nonfiction paperback, nonfiction digital, nonfiction audio} **b.** No **c.** 0.72 **d.** 0.28; 0.28 **e.** 0.8
6.17 **a.** 0.001 **b.** Classical
6.21 **a.** 35% of all tennis racquets purchased have a grip size of 4½ inches. **b.** 0.65 **c.** 0.55 **d.** 0.7
6.23 **a.** 0.4 **b.** 0.81 **c.** 0.94
6.25 **a.** 0.000495, 0.00198 **b.** 0.024 **c.** 0.146
6.27 **a.** BC, BM, BP, BS, CM, CP, CS, MP, MS, PS **b.** 0.1 **c.** 0.4 **d.** 0.3
6.29 **a.** $P(O_1) = P(O_3) = P(O_5) = 1/9$ and $P(O_2) = P(O_4) = P(O_6) = 2/9$ **b.** 1/3, 4/9 **c.** 9/21, 2/7
6.31 **a.** 0.24 **b.** 0.36 **c.** 0.12 **d.** 0.75
6.33 **a.** 0.72 **b.** The value 0.45 is the conditional probability that the selected individual drinks 2 or more cups a day given that he or she drinks coffee. We know this because the percentages given in the display total 100, and yet we know that only 72% of Americans drink coffee. So, the percentages given in the table must be the proportions *of coffee drinkers* who drink the given amounts.
6.37 $P(A|B)$ is larger. $P(A|B)$ is the probability that a randomly chosen professional basketball player is over 6 feet tall—a reasonably large probability. $P(B|A)$ is the probability that a randomly chosen person over 6 feet tall is a professional basketball player—a very small probability.
6.39 **a.** 0.337 **b.** 0.762 **c.** 0.625 **d.** 0.788 **e.** 0.869 **f.** Current smokers are the least likely to believe that smoking is very harmful, and those who have never smoked are the most likely to think that smoking is very harmful. This is not surprising since you would expect those who smoke to be the most confident about the health prospects of a smoker, with those who formerly smoked being a little more concerned, and those who have never smoked being the most concerned.
6.41 **a.** **i.** 0.167 **ii.** 0.068 **iii.** 0.238 **iv.** 0.833 **v.** 0.41 **vi.** 0.18 **b.** 18- to 24-year-olds are more likely than seniors to regularly wear seat belts.
6.43 **a.** 85% **b.** 0.15 **c.** 0.7225 **d.** 0.1275 **e.** 0.255 **f.** It is not reasonable.
6.45 $P(L)P(F) = 0.29$, not independent
6.47 Not independent
6.49 **a.** 0.001. We have to assume that she deals with the three errands independently. **b.** 0.999 **c.** 0.009
6.51 **a.** 0.81 **b.** P(1–2 subsystem doesn't work) = 0.19, P(3–4 subsystem doesn't work) = 0.19 **c.** P(system won't work) = 0.0361, P(system will work) = 0.9639 **d.** 0.9931, increases **e.** 0.9266, decreases
6.53 **a.** The expert was assuming that there was a 1 in 12 chance of a valve being in any one of the 12 clock positions and that the positions of the two air valves were independent. **b.** The positions of the two air valves are *not* independent, and 1/144 is smaller than the correct probability.