ection 11.7 *(page 871)*

Vocabulary Check *(page 871)*

1. experiment; outcomes 2. sample space
3. probability 4. impossible; certain
5. mutually exclusive 6. independent
7. complement 8. (a) iii (b) i (c) iv (d) ii

1. $\{(H, 1), (H, 2), (H, 3), (H, 4), (H, 5), (H, 6), (T, 1), (T, 2), (T, 3), (T, 4), (T, 5), (T, 6)\}$
2. $\{2, 3, \ldots, 12\}$
3. {ABC, ACB, BAC, BCA, CAB, CBA}
4. {(red, red), (red, blue), (red, yellow), (blue, blue), (blue, yellow)}
5. {AB, AC, AD, AE, BC, BD, BE, CD, CE, DE}
6. {SSS, SSF, SFS, SFF, FSS, FSF, FFS, FFF} 7. $\frac{3}{8}$
8. $\frac{1}{2}$ 9. $\frac{7}{8}$ 10. $\frac{1}{2}$ 11. $\frac{3}{13}$ 12. $\frac{10}{13}$ 13. $\frac{3}{26}$
4. $\frac{6}{13}$ (for A–6) 15. $\frac{1}{12}$ 16. $\frac{7}{12}$ 17. $\frac{11}{12}$ 18. $\frac{1}{9}$
9. $\frac{1}{3}$ 20. $\frac{19}{36}$ 21. $\frac{1}{5}$ 22. $\frac{1}{15}$ 23. $\frac{2}{5}$ 24. $\frac{11}{15}$
5. 0.3 26. 0.64 27. $\frac{3}{4}$ 28. $\frac{1}{3}$ 29. 0.86
0. 0.08 31. $\frac{18}{35}$ 32. $\frac{39}{100}$
3. (a) 58% (b) 95.6% (c) 0.4%
4. (a) 34% (b) 45% (c) 23%
5. (a) 243 (b) $\frac{1}{50}$ (c) $\frac{16}{25}$
6. (a) $\frac{59}{100}$ (b) $\frac{17}{100}$ (c) $\frac{87}{100}$
37. (a) $\frac{112}{209}$ (b) $\frac{97}{209}$ (c) $\frac{274}{627}$
38. (a) $\frac{62}{101}$ (b) $\frac{39}{101}$ (c) $\frac{12}{101}$
39. $P(\{\text{Taylor wins}\}) = \frac{1}{2}$
$P(\{\text{Moore wins}\}) = P(\{\text{Jenkins wins}\}) = \frac{1}{4}$
0. 19% 41. (a) $\frac{21}{1292}$ (b) $\frac{225}{646}$ (c) $\frac{49}{323}$
2. (a) $\frac{3}{8}$ (b) $\frac{19}{30}$ 43. (a) $\frac{1}{120}$ (b) $\frac{1}{24}$
4. (a) 0.076 (b) 0.00069 45. (a) $\frac{5}{13}$ (b) $\frac{1}{2}$ (c) $\frac{4}{13}$
6. $\frac{6}{4165}$ 47. (a) $\frac{14}{55}$ (b) $\frac{12}{55}$ (c) $\frac{54}{55}$
8. (a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) $\frac{841}{1600}$ (d) $\frac{1}{40}$ 49. 0.4746
50. 0.1024 51. (a) 0.9702 (b) 0.9998 (c) 0.0002
52. (a) 0.81 (b) 0.01 (c) 0.99
53. (a) $\frac{1}{16}$ (b) $\frac{1}{8}$ (c) $\frac{15}{16}$ 54. $\frac{7}{16}$
55. (a) $\frac{1}{38}$ (b) $\frac{9}{19}$ (c) $\frac{10}{19}$ (d) $\frac{1}{1444}$ (e) $\frac{729}{6859}$
(f) The probabilities are slightly better in European roulette.

56. (a) $\frac{\pi}{4}$ (b) Approximations will vary.

57. True. Two events are independent if the occurrence of one has no effect on the occurrence of the other.

58. False. The complement of the event is to roll a number greater than or equal to 3, and its probability is $\frac{2}{3}$.

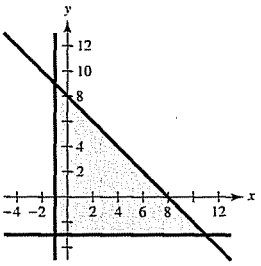
59. (a) As you consider successive people with distinct birthdays, the probabilities must decrease to take into account the birth dates already used. Because the birth dates of people are independent events, multiply the respective probabilities of distinct birthdays.
(b) $\frac{365}{365} \cdot \frac{364}{365} \cdot \frac{363}{365} \cdot \frac{362}{365}$ (c) Answers will vary.
(d) Q_n is the probability that the birthdays are *not* distinct, which is equivalent to at least two people having the same birthday.
(e)

n	10	15	20	23	30	40	50
P_n	0.88	0.75	0.59	0.49	0.29	0.11	0.03
Q_n	0.12	0.25	0.41	0.51	0.71	0.89	0.97

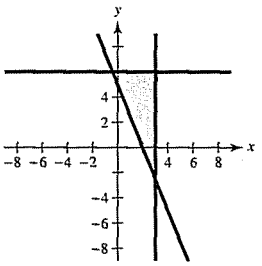
(f) 23

60. Meteorological records indicate that over an extended period of time with similar weather conditions it will rain 40% of the time.

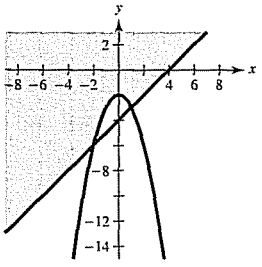
61. No real solution 62. $\frac{-3 \pm \sqrt{57}}{4}$
63. $0, \frac{1 \pm \sqrt{13}}{2}$ 64. $0, \pm 1$ 65. -4 66. ± 4
67. $\frac{11}{2}$ 68. -1 69. -10 70. 3
71.



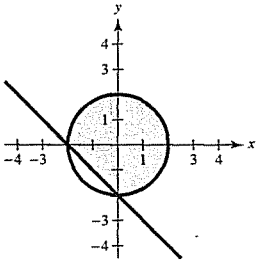
72.



73.



74.



Review Exercises *(page 877)*

1. 8, 5, 4, $\frac{7}{2}$, $\frac{16}{5}$ 2. $-5, \frac{10}{3}, -3, \frac{20}{7}, -\frac{25}{9}$
3. 72, 36, 12, 3, $\frac{3}{5}$ 4. 0, 2, 6, 12, 20 5. $a_n = 2(-1)^n$
6. $a_n = n^2 - 2$ 7. $a_n = \frac{4}{n}$ 8. $a_n = \frac{(-1)^{n+1}}{n}$
9. 120 10. 12 11. 1 12. $\frac{1}{8}$ 13. 30 14. 56
15. $\frac{205}{24}$ 16. 6.17 17. 6050 18. 35 19. $\sum_{k=1}^{20} \frac{1}{2k}$

CHAPTER 11