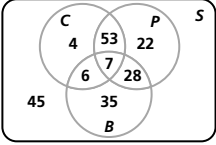
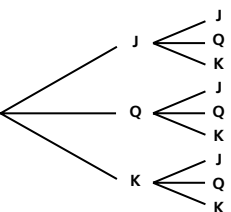


9. Answers may vary; for example:
 (a) Selecting a number that is either even or odd
 (b) Rolling a die and drawing a card from a deck of 52 cards
 (c) Selecting an even number and selecting a multiple of 5
 (d) Drawing a card and then drawing another card without replacement
10. (a) $\frac{4}{5}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) $\frac{3}{10}$ (e) 1:1
11. (a) $\frac{1}{2730}$ (b) $\frac{1}{455}$

Chapter 4 Test, page 270

1. (a) 
- (b) 45 (c) $\frac{19}{50}$ (d) $\frac{3}{5}$
2. (a) 
- (b) 3 (c) $\frac{1}{3}$
3. $\frac{1}{20\ 825}$
4. 1001
6. $\frac{1}{14}$
7. (a) (i) $\frac{80}{243}$ (ii) $\frac{304}{729}$
 (b) (i) $\frac{5}{14}$ (ii) $\frac{17}{42}$
8. 0.5687

Chapter 5

5.1 Exercises, page 277

1. (a) There can only be 0, 1, or 2 heads.
 (b) 0 heads: $\frac{1}{4}$, 1 head: $\frac{1}{2}$, 2 heads: $\frac{1}{4}$
 (c) 1
2. (a), (c), (e)
3. A probability distribution gives the probability of each outcome. Therefore, they must add to 1.
4. (a), (c) Probabilities add to 1.
5. 3.5
6. 4.5
7. (a) $\frac{5}{18}$ (b) $\frac{1}{9}$ (c) $\frac{5}{6}$ (d) $\frac{7}{18}$
8. 1: $\frac{1}{8}$, 2: $\frac{1}{8}$, 3: $\frac{1}{8}$, 4: $\frac{1}{8}$, 5: $\frac{1}{8}$, 6: $\frac{1}{8}$, 7: $\frac{1}{8}$, 8: $\frac{1}{8}$
9. 2: $\frac{1}{64}$, 3: $\frac{1}{32}$, 4: $\frac{3}{64}$, 5: $\frac{1}{16}$, 6: $\frac{5}{64}$, 7: $\frac{3}{32}$, 8: $\frac{7}{64}$, 9: $\frac{1}{8}$, 10: $\frac{7}{64}$, 11: $\frac{3}{32}$, 12: $\frac{5}{64}$, 13: $\frac{1}{16}$, 14: $\frac{3}{64}$, 15: $\frac{1}{32}$, 16: $\frac{1}{64}$
10. (a) 0: $\frac{2}{5}$, 1: $\frac{8}{15}$, 2: $\frac{1}{15}$
 (b) Answers may vary; for example, 0: $\frac{9}{25}$, 1: $\frac{29}{50}$, 2: $\frac{3}{50}$
 (c) 0: $\frac{2}{5}$, 1: $\frac{53}{100}$, 2: $\frac{7}{100}$ (d) 0.67

11. (a) Answers may vary; for example, 0: 0.68, 1: 0.3, 2: 0.02.
 (b) Answers may vary; for example, 0: 0.65, 1: 0.3, 2: 0.05.
 (c) 0: 0.64, 1: 0.32, 2: 0.04 (d) 0.4
12. Yes, submit the bid. The expected return is \$15 000.
13. (a) Answers may vary; for example, 0: 0, 1: 0, 2: 0, 3: 0, 4: 0, 5: 0, 6: 0.05, 7: 0.05, 8: 0.1, 9: 0.1, 10: 0.22, 11: 0.15, 12: 0.12, 13: 0.08, 14: 0.05, 15: 0.08, 16: 0, 17: 0, 18: 0, 19: 0, 20: 0
 (b) Answers may vary; for example, 0: 0, 1: 0, 2: 0, 3: 0, 4: 0, 5: 0, 6: 0.03, 7: 0.07, 8: 0.14, 9: 0.17, 10: 0.2, 11: 0.16, 12: 0.12, 13: 0.06, 14: 0.03, 15: 0.02, 16: 0, 17: 0, 18: 0, 19: 0, 20: 0
 (c) Answers may vary; for example, 0: 0, 1: 0, 2: 0, 3: 0, 4: 0, 5: 0.01, 6: 0.04, 7: 0.07, 8: 0.12, 9: 0.16, 10: 0.18, 11: 0.16, 12: 0.12, 13: 0.07, 14: 0.04, 15: 0.01, 16: 0, 17: 0, 18: 0, 19: 0, 20: 0
 (d) 0.021
14. \$30

5.2 Exercises, page 289

1. (a) $\binom{11}{3}$ (b) $\binom{21}{19}$ (c) $\binom{16}{14}$ (d) $\binom{n+1}{r-1}$
2. (a) $\binom{10}{8}$ (b) $\binom{20}{2}$ (c) $\binom{15}{1}$ (d) $\binom{100}{2}$
 (e) $\binom{7}{0}$ (f) $\binom{20}{20}$ (g) $\binom{25}{24}$ (h) $\binom{100}{7}$
3. (a) $x^6 + 6x^5y + 15x^4y^2 + 20x^3y^3 + 15x^2y^4 + 6xy^5 + y^6$
 (b) $a^5 + 5a^4b + 10a^3b^2 + 10a^2b^3 + 5ab^4 + b^5$
 (c) $1^4 + 4(1)^3(-2) + 6(1)^2(-2)^2 + 4(1)(-2)^3 + (-2)^4$
 (d) $\left(\frac{2}{3}\right)^5 + 5\left(\frac{2}{3}\right)^4\left(\frac{1}{3}\right) + 10\left(\frac{2}{3}\right)^3\left(\frac{1}{3}\right)^2 + 10\left(\frac{2}{3}\right)^2\left(\frac{1}{3}\right)^3 + 5\left(\frac{2}{3}\right)\left(\frac{1}{3}\right)^4 + \left(\frac{1}{3}\right)^5$
4. (a) 6 (b) 2 (c) 2 (d) 3
5. $(a+b)^7$
6. 8
7. 204
8. (a) 10 (b) 10 (c) 23
9. (a) All equal 0 except row 1. (b) All equal 0. (c) 0, $n \neq 0$
10. (a) 10, 15, 21 (b) third diagonal ($r = 2$)
 (c) $\binom{n+1}{n-1}$ or $\binom{n+1}{2}$ (d) 5050
11. 8
12. 462
13. (a) $a^4 + 8a^3b + 24a^2b^2 + 32ab^3 + 16b^4$
 (b) $x^6 - 6x^5y + 15x^4y^2 - 20x^3y^3 + 15x^2y^4 - 6xy^5 + y^6$
 (c) $c^4 + 4c^2 + 6 + 4c^{-2} + c^{-4}$
 (d) $d^5 - 5d^3 + 10d - 10d^{-1} + 5d^{-3} - d^{-5}$
14. (a) $t_{r+1} = \binom{10}{r}x^{10-r}y^r$ (b) $t_{r+1} = (-1)^r\binom{10}{r}x^{10-r}y^r$
 (c) $t_{r+1} = \binom{8}{r}z^{8-2r}$ (d) $t_{r+1} = \binom{9}{r}w^{18-3r}$
15. (a) $84x^{10}$ (b) $70c^4d^4$ (c) $-160\ 380x^{-6}$
 (d) does not exist (e) $\frac{1215}{4096}$
17. The identities are the same with n replaced by $n-1$.
18. The identities are the same with r replaced by $r-1$.
19. $a = 3$, $b = 2$, $n = 8$

5.3 Exercises, page 299

1. (a) (i) 10 (ii) $\frac{1}{2}$ (iii) 6
 (b) (i) 7 (ii) $\frac{1}{3}$ (iii) 3
2. 1
3. $\binom{n}{k}2^{-n}$
4. It is the sum of the probabilities of all the possible outcomes, which always adds to 1.