

Answers to Even-Numbered Exercises

Exercises 11.1

$$2. S = \left\{ \begin{array}{l} (1, 1), (1, 2), (1, 3), (1, 4), (2, 1), (2, 2), (2, 3), (2, 4) \\ (3, 1), (3, 2), (3, 3), (3, 4), (4, 1), (4, 2), (4, 3), (4, 4) \end{array} \right\}$$

$$8. S = \{0, 1, 2, 3, 4, \dots\}$$

14. (a), (c), (d) Not feasible (b) and (e) Feasible

16. (a) $P(E) = 0.30$, $P(F) = 0.69$ (b) 0.70 (c) 0 (d) 0.99

20. (a) E' , and $P(E') = \frac{1}{4}$.

(b) The event is D' , and $P(D') = \frac{3}{4}$

(c) The event is C' , and $P(C') = \frac{1}{2}$

(d) The event is $A \cup B$, and $P(A \cup B) = \frac{2}{9}$

(e) The event is $A' \cap B'$, and $P(A' \cap B') = \frac{7}{9}$

26. (a) 0.96 (b) 0.64 (c) 0.28

28. (a) $\frac{1}{6}$ (b) $\frac{5}{6}$

Exercises 11.2

2. (a) $\frac{3}{8}$ (b) $\frac{1}{2}$ (c) $\frac{3}{4}$ (d) $\frac{4}{7}$

8. (a) $\frac{4}{7}$ (b) $\frac{38}{41}$

10. (a) $\frac{1}{16}$ (b) $\frac{9}{16}$ (c) $\frac{3}{8}$

22. (a) 10^{-8} (b) $(0.9999)^2$ (c) $1 - 10^{-8}$

28. ≈ 0.5948

30. $\frac{5}{11}$

Exercises 11.3

2. (a)

x	2	3	4	5	6	7	8
$P(X = x)$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{1}{16}$

 (b) $P(3 \leq X \leq 7) = \frac{7}{8}$.

8. (a) 16.6 (b) 9.64

10. $E(X) = 0$, $\text{Var}(X) = 2$

Exercises 11.4

4. (a) 225/512 (b) 675/2,048

12. (a) ≈ 0.02592 (b) ≈ 0.2666 (c) ≈ 0.00017

20. (a) 2 (b) 5/3

Exercises 11.5

4. Check that $f(x) \geq 0$ and $\int_0^\infty f(x)dx = 1$

12. not a probability function, since $f(x) < 0$ for $-1 < x < 0$

24. $1 - \frac{1}{x^3}$

36. 9/8

46. (a) 3 (b) $3 \ln 2 \approx 2.08$ (c) 3 minutes average waiting time, and about half the customers would wait less than 2.08 minutes

Exercises 11.6

2. (a) $\frac{1}{3}$ (b) 0 (c) $\frac{\sqrt{3}}{3}$

4. (a) $e^{-2.7}$ (b) $\frac{10}{3}$ months.

22. (a) 6.68% (b) 30.85% (c) 68.26%