Chapter 14

Counting and Probability

14.3 Probability

1. Probabilities must be between 0 and 1, inclusive. Thus, 0, 0.01, 0.35, and 1 are probabilities.

2. Probabilities must be between 0 and 1, inclusive. Thus, $\frac{1}{2}, \frac{3}{4}, \frac{2}{3}, \text{and}\ ($ are probabilities.

3. All the probabilities are between 0 and 1.
   The sum of the probabilities is 0.2 + 0.3 + 0.1 + 0.4 = 1.
   This is a probability model.

4. All the probabilities are between 0 and 1.
   The sum of the probabilities is 0.4 + 0.3 + 0.1 + 0.2 = 1.
   This is a probability model.

5. All the probabilities are between 0 and 1.
   The sum of the probabilities is 0.3 + 0.2 + 0.1 + 0.3 = 0.9.
   This is not a probability model.

6. One probability is not between 0 and 1.
   This is not a probability model.

7. The sample space is: $S = \{HH, HT, TH, TT\}$.
   Each outcome is equally likely to occur; so $P(E) = \dfrac{n(E)}{n(S)}$.
   The probabilities are: $P(HH) = \frac{1}{4}$, $P(HT) = \frac{1}{4}$, $P(TH) = \frac{1}{4}$, $P(TT) = \frac{1}{4}$.

8. The sample space is: $S = \{HH, HT, TH, TT\}$.
   Each outcome is equally likely to occur; so $P(E) = \dfrac{n(E)}{n(S)}$.
   The probabilities are: $P(HH) = \frac{1}{4}$, $P(HT) = \frac{1}{4}$, $P(TH) = \frac{1}{4}$, $P(TT) = \frac{1}{4}$.

9. The sample space of tossing two fair coins and a fair die is:
   $$S = \{HH1, HH2, HH3, HH4, HH5, HH6, HT1, HT2, HT3, HT4, HT5, HT6, TH1, TH2, TH3, TH4, TH5, TH6, TT1, TT2, TT3, TT4, TT5, TT6\}$$
   There are 24 equally likely outcomes and the probability of each is $\frac{1}{24}$.

10. The sample space of tossing a fair coins, a fair die, and a fair coin is:
$S = \{H1H,\ H2H,\ H3H,\ H4H,\ H5H,\ H6H,\ H1T,\ H2T,\ H3T,\ H4T,\ H5T,$
$H6T,\ T1H,\ T2H,\ T3H,\ T4H,\ T5H,\ T6H,\ T1T,\ T2T,\ T3T,\ T4T,\ T5T,\ T6T\}$
There are 24 equally likely outcomes and the probability of each is $\frac{1}{24}$.

11. The sample space for tossing three fair coins is:
$S = \{HHH,\ HHT,\ HTH,\ THH,\ HTT,\ THT,\ TTH,\ TTT\}$
There are 8 equally likely outcomes and the probability of each is $\frac{1}{8}$.

12. The sample space for tossing one fair coin three times is:
$S = \{HHH,\ HHT,\ HTH,\ THH,\ HTT,\ THT,\ TTH,\ TTT\}$
There are 8 equally likely outcomes and the probability of each is $\frac{1}{8}$.

13. The sample space is:
S = {1 Yellow, 1 Red, 1 Green, 2 Yellow, 2 Red, 2 Green, 3 Yellow, 3 Red, 3 Green, 4 Yellow, 4 Red, 4 Green}
There are 12 equally likely events and the probability of each is $\frac{1}{12}$. The probability of getting a 2 or 4 followed by a Red is $P(2\ \text{Red}) + P(4\ \text{Red}) = \frac{1}{12} + \frac{1}{12} = \frac{1}{6}$.

14. The sample space is:
S = {Forward Yellow, Forward Red, Forward Green, Backward Yellow, Backward Red, Backward Green}
There are 6 equally likely events and the probability of each is $\frac{1}{6}$. The probability of getting Forward followed by Yellow or Green is:
$P(\text{Forward Yellow}) + P(\text{Forward Green}) = \frac{1}{6} + \frac{1}{6} = \frac{1}{3}$.

15. The sample space is:
S = {1 Yellow Forward, 1 Yellow Backward, 1 Red Forward, 1 Red Backward, 1 Green Forward, 1 Green Backward, 2 Yellow Forward, 2 Yellow Backward, 2 Red Forward, 2 Red Backward, 2 Green Forward, 2 Green Backward, 3 Yellow Forward, 3 Yellow Backward, 3 Red Forward, 3 Red Backward, 3 Green Forward, 3 Green Backward, 4 Yellow Forward, 4 Yellow Backward, 4 Red Forward, 4 Red Backward, 4 Green Forward, 4 Green Backward}
There are 24 equally likely events and the probability of each is $\frac{1}{24}$. The probability of getting a 1, followed by a Red or Green, followed by a Backward is
$P(\text{1 Red Backward}) + P(\text{1 Green Backward}) = \frac{1}{24} + \frac{1}{24} = \frac{1}{12}$.

16. The sample space is:
S = {Yellow 1 Forward, Yellow 1 Backward, Red 1 Forward, Red 1 Backward, Green 1 Forward, Green 1 Backward, Yellow 2 Forward, Yellow 2 Backward, Red 2 Forward, Red 2 Backward, Green 2 Forward, Green 2 Backward, Yellow 3 Forward, Yellow 3 Backward, Red 3 Forward, Red 3 Backward,Green 3 Forward, Green 3 Backward, Yellow 4 Forward, Yellow 4 Backward, Red 4 Forward, Red 4 Backward, Green 4 Forward, Green 4 Backward}

There are 24 equally likely events and the probability of each is $\frac{1}{24}$. The probability of getting a Yellow, followed by a 2 or 4, followed by a Forward is

$P(\text{Yellow 2 Forward}) + P(\text{Yellow 4 Forward}) = \frac{1}{24} + \frac{1}{24} = \frac{1}{12}$.

17. The sample space is:
S = {1 1 Yellow, 1 1 Red, 1 1 Green, 1 2 Yellow, 1 2 Red, 1 2 Green, 1 3 Yellow, 1 3 Red, 1 3 Green, 1 4 Yellow, 1 4 Red, 1 4 Green, 2 1 Yellow, 2 1 Red, 2 1 Green, 2 2 Yellow, 2 2 Red, 2 2 Green, 2 3 Yellow, 2 3 Red, 2 3 Green, 2 4 Yellow, 2 4 Red, 2 4 Green, 3 1 Yellow, 3 1 Red, 3 1 Green, 3 2 Yellow, 3 2 Red, 3 2 Green, 3 3 Yellow, 3 3 Red, 3 3 Green, 3 4 Yellow, 3 4 Red, 3 4 Green, 4 1 Yellow, 4 1 Red, 4 1 Green, 4 2 Yellow, 4 2 Red, 4 2 Green, 4 3 Yellow, 4 3 Red, 4 3 Green, 4 4 Yellow, 4 4 Red, 4 4 Green}

There are 48 equally likely events and the probability of each is $\frac{1}{48}$. The probability of getting a 2, followed by a 2 or 4, followed by a Red or Green is

$P(\text{2 2 Red}) + P(\text{2 4 Red}) + P(\text{2 2 Green}) + P(\text{2 4 Green}) = \frac{1}{48} + \frac{1}{48} + \frac{1}{48} + \frac{1}{48} = \frac{1}{12}$

18. The sample space is:
S = {Forward 11, Forward 12, Forward 13, Forward 14, Forward 21, Forward 22, Forward 23, Forward 24, Forward 31, Forward 32, Forward 33, Forward 34, Forward 41, Forward 42, Forward 43, Forward 44, Backward 11, Backward 12, Backward 13, Backward 14, Backward 21, Backward 22, Backward 23, Backward 24, Backward 31, Backward 32, Backward 33, Backward 34, Backward 41, Backward 42, Backward 43, Backward 44}

There are 32 equally likely events and the probability of each is $\frac{1}{32}$. The probability of getting a Forward, followed by a 1 or 3, followed by a 2 or 4 is

$$P(\text{Forward 12}) + P(\text{Forward 14}) + P(\text{Forward 32}) + P(\text{Forward 34})$$
$$= \frac{1}{32} + \frac{1}{32} + \frac{1}{32} + \frac{1}{32} = \frac{1}{8}$$

19. A, B, C, F

20. A

21. B

22. F

23. Let $P(\text{tails}) = x$, then $P(\text{heads}) = 4x$

$$x + 4x = 1 \rightarrow 5x = 1 \rightarrow x = \frac{1}{5} \qquad P(\text{tails}) = \frac{1}{5}, \quad P(\text{heads}) = \frac{4}{5}$$

24. Let $P(\text{heads}) = x$, then $P(\text{tails}) = 2x$

$$x + 2x = 1 \rightarrow 3x = 1 \rightarrow x = \frac{1}{3} \qquad P(\text{heads}) = \frac{1}{3}, \quad P(\text{tails}) = \frac{2}{3}$$

25. $P(2) = P(4) = P(6) = x \qquad P(1) = P(3) = P(5) = 2x$

$$P(1) + P(2) + P(3) + P(4) + P(5) + P(6) = 1$$

$$2x + x + 2x + x + 2x + x = 1 \rightarrow 9x = 1 \rightarrow x = \frac{1}{9}$$

$$P(2) = P(4) = P(6) = \frac{1}{9} \qquad P(1) = P(3) = P(5) = \frac{2}{9}$$

26. $P(1) = P(2) = P(3) = P(4) = P(5) = x \qquad P(6) = 0$

$$P(1) + P(2) + P(3) + P(4) + P(5) + P(6) = 1$$

$$x + x + x + x + x + 0 = 1 \rightarrow 5x = 1 \rightarrow x = \frac{1}{5}$$

$$P(1) = P(2) = P(3) = P(4) = P(5) = \frac{1}{5} \qquad P(6) = 0$$

27. $P(E) = \dfrac{n(E)}{n(S)} = \dfrac{n\{1,2,3\}}{10} = \dfrac{3}{10}$

28. $P(F) = \dfrac{n(F)}{n(S)} = \dfrac{n\{3, 5, 9, 10\}}{10} = \dfrac{4}{10} = \dfrac{2}{5}$

29. $P(E) = \dfrac{n(E)}{n(S)} = \dfrac{n\{2,4,6,8,10\}}{10} = \dfrac{5}{10} = \dfrac{1}{2}$

30. $P(F) = \dfrac{n(F)}{n(S)} = \dfrac{n\{1, 3, 5, 7, 9\}}{10} = \dfrac{5}{10} = \dfrac{1}{2}$

31. $P(\text{white}) = \dfrac{n(\text{white})}{n(S)} = \dfrac{5}{5 + 10 + 8 + 7} = \dfrac{5}{30} = \dfrac{1}{6}$

32. $P(\text{black}) = \dfrac{n(\text{black})}{n(S)} = \dfrac{7}{5 + 10 + 8 + 7} = \dfrac{7}{30}$

33. The sample space is: S = {BBB, BBG, BGB, GBB, BGG, GBG, GGB, GGG}

$$P(3 \text{ boys}) = \frac{n(3 \text{ boys})}{n(S)} = \frac{1}{8}$$

34. The sample space is: S = {BBB, BBG, BGB, GBB, BGG, GBG, GGB, GGG}

$$P(3 \text{ girls}) = \frac{n(3 \text{ girls})}{n(S)} = \frac{1}{8}$$

35. The sample space is:
S = {BBBB, BBBG, BBGB, BGBB, GBBB, BBGG, BGBG, GBBG, BGGB, GBGB, GGBB, BGGG, GBGG, GGBG, GGGB, GGGG}

$$P(\text{1 girl, 3 boys}) = \frac{n(\text{1 girl, 3 boys})}{n(S)} = \frac{4}{16} = \frac{1}{4}$$

36. The sample space is:
S = {BBBB, BBBG, BBGB, BGBB, GBBB, BBGG, BGBG, GBBG, BGGB, GBGB, GGBB, BGGG, GBGG, GGBG, GGGB, GGGG}

$$P(\text{2 girl, 2 boys}) = \frac{n(\text{2 girl, 2 boys})}{n(S)} = \frac{6}{16} = \frac{3}{8}$$

37. $$P(\text{sum of two die is 7}) = \frac{n(\text{sum of two die is 7})}{n(S)}$$
$$= \frac{n\{1,6 \text{ or } 2,5 \text{ or } 3,4 \text{ or } 4,3 \text{ or } 5,2 \text{ or } 6,1\}}{n(S)} = \frac{6}{36} = \frac{1}{6}$$

38. $$P(\text{sum of two die is 11}) = \frac{n(\text{sum of two die is 11})}{n(S)} = \frac{n\{5,6 \text{ or } 6,5\}}{n(S)} = \frac{2}{36} = \frac{1}{18}$$

39. $$P(\text{sum of two die is 3}) = \frac{n(\text{sum of two die is 3})}{n(S)} = \frac{n\{1,2 \text{ or } 2,1\}}{n(S)} = \frac{2}{36} = \frac{1}{18}$$

40. $$P(\text{sum of two die is 12}) = \frac{n(\text{sum of two die is 12})}{n(S)} = \frac{n\{6,6\}}{n(S)} = \frac{1}{36}$$

41. $P(A \quad B) = P(A) + P(B) - P(A \cap B) = 0.25 + 0.45 - 0.15 = 0.55$

42. $P(A \cap B) = P(A) + P(B) - P(A \quad B) = 0.25 + 0.45 - 0.6 = 0.1$

43. $P(A \quad B) = P(A) + P(B) = 0.25 + 0.45 = 0.70$

44. $P(A \cap B) = 0$

45. $$\begin{aligned} P(A \quad B) &= P(A) + P(B) - P(A \cap B) \\ 0.85 &= 0.60 + P(B) - 0.05 \\ P(B) &= 0.85 - 0.60 + 0.05 = 0.30 \end{aligned}$$

46. $$\begin{aligned} P(A \quad B) &= P(A) + P(B) - P(A \cap B) \\ 0.65 &= P(A) + 0.30 - 0.15 \\ P(A) &= 0.65 - 0.30 + 0.15 = 0.50 \end{aligned}$$

47. $P(\text{not victim}) = 1 - P(\text{victim}) = 1 - 0.253 = 0.747$

48. $P(\text{not victim}) = 1 - P(\text{victim}) = 1 - 0.056 = 0.944$

49. $P(\text{not in 70's}) = 1 - P(\text{in 70's}) = 1 - 0.3 = 0.7$

50. $P(\text{not in 30's}) = 1 - P(\text{in 30's}) = 1 - 0.04 = 0.96$

51. $P(\text{white or green}) = P(\text{white}) + P(\text{green}) = \dfrac{n(\text{white}) + n(\text{green})}{n(S)} = \dfrac{9+8}{9+8+3} = \dfrac{17}{20}$

52. $P(\text{white or orange}) = P(\text{white}) + P(\text{orange}) = \dfrac{n(\text{white}) + n(\text{orange})}{n(S)} = \dfrac{9+3}{9+8+3}$
$= \dfrac{12}{20} = \dfrac{3}{5}$

53. $P(\text{not white}) = 1 - P(\text{white}) = 1 - \dfrac{n(\text{white})}{n(S)} = 1 - \dfrac{9}{20} = \dfrac{11}{20}$

54. $P(\text{not green}) = 1 - P(\text{green}) = 1 - \dfrac{n(\text{green})}{n(S)} = 1 - \dfrac{8}{20} = \dfrac{12}{20} = \dfrac{3}{5}$

55. $P(\text{strike or one}) = P(\text{strike}) + P(\text{one}) = \dfrac{n(\text{strike}) + n(\text{one})}{n(S)} = \dfrac{3+1}{8} = \dfrac{4}{8} = \dfrac{1}{2}$

56. $P(100 \text{ or } 30) = P(100) + P(30) = \dfrac{n(100) + n(30)}{n(S)} = \dfrac{1+1}{20} = \dfrac{2}{20} = \dfrac{1}{10}$

57. There are 30 households out of 100 with an income of \$30,000 or more.
$P(E) = \dfrac{n(E)}{n(S)} = \dfrac{n(30{,}000 \text{ or more})}{n(\text{total households})} = \dfrac{30}{100} = \dfrac{3}{10}$

58. There are 65 households out of 100 with an income between \$10,000 and \$29,999.
$P(E) = \dfrac{n(E)}{n(S)} = \dfrac{n(10{,}000 \text{ to } 29{,}999)}{n(\text{total households})} = \dfrac{65}{100} = \dfrac{13}{20} = 0.65$

59. There are 40 households out of 100 with an income of less than \$20,000.
$P(E) = \dfrac{n(E)}{n(S)} = \dfrac{n(\text{less than } \$20{,}000)}{n(\text{total households})} = \dfrac{40}{100} = \dfrac{2}{5}$

60. There are 60 households out of 100 with an income of \$20,000 or more.
$P(E) = \dfrac{n(E)}{n(S)} = \dfrac{n(\$20{,}000 \text{ or more})}{n(\text{total households})} = \dfrac{60}{100} = \dfrac{3}{5}$

61. (a) $P(1 \text{ or } 2) = P(1) + P(2) = 0.24 + 0.33 = 0.57$
(b) $P(1 \text{ or more}) = P(1) + P(2) + P(3) + P(4 \text{ or more})$
$= 0.24 + 0.33 + 0.21 + 0.17 = 0.95$
(c) $P(3 \text{ or fewer}) = P(0) + P(1) + P(2) + P(3) = 0.05 + 0.24 + 0.33 + 0.21 = 0.83$
(d) $P(3 \text{ or more}) = P(3) + P(4 \text{ or more}) = 0.21 + 0.17 = 0.38$
(e) $P(\text{less than } 2) = P(0) + P(1) = 0.05 + 0.24 = 0.29$
(f) $P(\text{less than } 1) = P(0) = 0.05$
(g) $P(1, 2, \text{ or } 3) = P(1) + P(2) + P(3) = 0.24 + 0.33 + 0.21 = 0.78$
(h) $P(2 \text{ or more}) = P(2) + P(3) + P(4 \text{ or more}) = 0.33 + 0.21 + 0.17 = 0.71$

62. (a) $P(\text{at most } 2) = P(0) + P(1) + P(2) = 0.10 + 0.15 + 0.20 = 0.45$
(b) $P(\text{at least } 2) = P(2) + P(3) + P(4 \text{ or more}) = 0.20 + 0.24 + 0.31 = 0.75$
(c) $P(\text{at least } 1) = 1 - P(0) = 1 - 0.10 = 0.90$

63. (a)
$$\begin{aligned} P(\text{freshman or female}) &= P(\text{freshman}) + P(\text{female}) - P(\text{freshman and female}) \\ &= \frac{n(\text{freshman}) + n(\text{female}) - n(\text{freshman and female})}{n(S)} \\ &= \frac{18 + 15 - 8}{33} = \frac{25}{33} \end{aligned}$$
(b)
$$\begin{aligned} P(\text{sophomore or male}) &= P(\text{sophomore}) + P(\text{male}) - P(\text{sophomore and male}) \\ &= \frac{n(\text{sophomore}) + n(\text{male}) - n(\text{sophomore and male})}{n(S)} \\ &= \frac{15 + 18 - 8}{33} = \frac{25}{33} \end{aligned}$$

64. (a)
$$\begin{aligned} P(\text{female or under } 40) &= P(\text{female}) + P(\text{under } 40) - P(\text{female and under } 40) \\ &= \frac{n(\text{female}) + n(\text{under } 40) - n(\text{female and under } 40)}{n(S)} \\ &= \frac{4 + 5 - 2}{13} = \frac{7}{13} \end{aligned}$$
(b)
$$\begin{aligned} P(\text{male or over } 40) &= P(\text{male}) + P(\text{over } 40) - P(\text{male and over } 40) \\ &= \frac{n(\text{male}) + n(\text{over } 40) - n(\text{male and over } 40)}{n(S)} \\ &= \frac{9 + 8 - 6}{13} = \frac{11}{13} \end{aligned}$$

65.
$$\begin{aligned} P(\text{at least 2 with same birthday}) &= 1 - P(\text{none with same birthday}) \\ &= 1 - \frac{n(\text{different birthdays})}{n(S)} \\ &= 1 - \frac{365 \cdot 364 \cdot 363 \cdot 362 \cdot 361 \cdot 360 \cdots 354}{365^{12}} \\ &= 1 - 0.833 \\ &= 0.167 \end{aligned}$$

66.
$$\begin{aligned} P(\text{at least 2 with same birthday}) &= 1 - P(\text{none with same birthday}) \\ &= 1 - \frac{n(\text{different birthdays})}{n(S)} \\ &= 1 - \frac{365 \cdot 364 \cdot 363 \cdot 362 \cdot 361 \cdot 360 \cdots 331}{365^{35}} \\ &= 1 - 0.1856 = 0.8144 \end{aligned}$$

67. The sample space for picking 5 out of 10 numbers in a particular order contains
$$P(10,5) = \frac{10!}{(10-5)!} = \frac{10!}{5!} = 30{,}240 \text{ possible outcomes.}$$
One of these is the desired outcome. Thus, the probability of winning is:
$$P(E) = \frac{n(E)}{n(S)} = \frac{n(\text{winning})}{n(\text{total possible outcomes})} = \frac{1}{30240}$$

68. The sample space is the number of ways of choosing members for the committee:

$$C(14,6) = \frac{14!}{(14-6)!\ 6!} = \frac{14!}{8!\,6!} = 3003$$

The number of ways of choosing 0 supervisors from 2:

$$C(2,0) = \frac{2!}{(2-0)!\ 0!} = \frac{2!}{2!\,0!} = 1$$

The number of ways of choosing 2 skilled laborers from 5:

$$C(5,2) = \frac{5!}{(5-2)!\ 2!} = \frac{5!}{3!\,2!} = 10$$

The number of ways of choosing 4 unskilled laborers from 7:

$$C(7,4) = \frac{7!}{(7-4)!\ 4!} = \frac{7!}{3!\,4!} = 35$$

Using the multiplication principle:

$$P(\text{2skilled and 4 unskilled}) = \frac{1\ 10\ 35}{3003} = \frac{350}{3003} \approx 0.1166$$

69. (a) $P(\text{3 heads}) = \dfrac{C(5,3)}{2^5} = \dfrac{10}{32} = \dfrac{5}{16}$

(b) $P(\text{0 heads}) = \dfrac{C(5,0)}{2^5} = \dfrac{1}{32}$

70. (a) $P(\text{1 tail}) = \dfrac{C(4,1)}{2^4} = \dfrac{4}{16} = \dfrac{1}{4}$

(b) $P(\text{no more than 1 tail}) = P(\text{0 tails}) + P(\text{1 tail}) = \dfrac{1+4}{2^4} = \dfrac{5}{16}$

71. (a) $P(\text{sum } = 7 \text{ three times}) = P(\text{sum } = 7)\ P(\text{sum } = 7)\ P(\text{sum } = 7)$

$$= \frac{1}{6}\ \frac{1}{6}\ \frac{1}{6} = \frac{1}{216}$$

(b) $P(\text{sum } = 7 \text{ or 11 at least twice})$

$$= P(\text{sum } = 7 \text{ or } 11)\ P(\text{sum } = 7 \text{ or } 11)\ P(\text{sum } \neq 7 \text{ or } 11) +$$
$$P(\text{sum } = 7 \text{ or } 11)\ P(\text{sum } = 7 \text{ or } 11)\ P(\text{sum } = 7 \text{ or } 11)$$
$$= \frac{8}{36}\ \frac{8}{36}\ \frac{28}{36} + \frac{8}{36}\ \frac{8}{36}\ \frac{8}{36} = 0.049$$

72. (a) $P(\text{sum } \neq 2) = 1 - P(\text{sum } = 2) = 1 - \dfrac{1}{36} = \dfrac{35}{36}$

$P(\text{sum } \neq 2 \text{ on 5 tosses}) = \left(\dfrac{35}{36}\right)^5 = 0.8686$

(b) $P(\text{sum } \neq 7) = 1 - P(\text{sum } = 7) = 1 - \dfrac{6}{36} = \dfrac{30}{36} = \dfrac{5}{6}$

$P(\text{sum } \neq 7 \text{ on 5 tosses}) = \left(\dfrac{5}{6}\right)^5 = 0.4019$

73. $P(\text{all 5 defective}) = \dfrac{n(\text{5 defective})}{n(S)} = \dfrac{1}{C(30,5)} = 7.02 \times 10^{-6}$

$P(\text{at least 2 defective}) = 1 - \left(P(\text{none defective}) + P(\text{one defective})\right)$

$= 1 - \left(\dfrac{C(5,0)\,C(25,5)}{C(30,5)} + \dfrac{C(5,1)\,C(25,4)}{C(30,5)}\right) = 1 - 0.817 = 0.183$

74. $P(\text{30 nondefective}) = \dfrac{n(\text{30 nondefective chosen from 40})}{n(S)}$

$= \dfrac{C(40,30)}{C(50,30)} = 1.7986 \times 10^{-5}$

75. $P(\text{one of 5 coins is valued at more than } \$10{,}000) = \dfrac{C(49,4)\,C(1,1)}{C(50,5)} = 0.1$