

1. Two wheels of chance are spun. The first is marked with the numbers 1, 2, 3, 4, and the second with 1, 2, 3. On both wheels, each number is equally likely. List the elements in a uniform sample space and compute the probabilities of the following events:
  - (a) Exactly one of the numbers is odd.
  - (b) Both numbers are even.
  - (c) The sum of the numbers is 5.
  - (d) The sum of the numbers is no more than 5.
  - (e) The product of the two numbers is even.
  - (f) The product is even, given that a 1 is showing on the second wheel.
  - (g) The product is even, given that a 2 is showing on the second wheel.
  - (h) The product is even, given that both wheels show the same number.
2. Suppose you have a fair die and four cards numbered 1, 2, 3, 4. You roll the die and draw a card. List the elements in a uniform sample space and compute the probabilities of the following events:
  - (a) The number on the card is bigger than the number on the die.
  - (b) The sum of the numbers is 6.
  - (c) At least one of the numbers is 3.
  - (d) The sum of the numbers is at most 4.
  - (e) The product of the numbers is at least 10.
  - (f) The sum of the numbers is 8, given that the number on the card is bigger than the number on the die.
  - (g) The sum is 8, given that the sum is at least 6.
3. An urn contains a penny, a nickel, a dime, a quarter, a half dollar, and a Susan B. Anthony dollar. Two coins are chosen at once. List the elements in a uniform sample space and compute the probabilities of the following events:
  - (a) The total value of the coins is at least 30 cents.
  - (b) The total value is at most 20 cents.
  - (c) The total value is a multiple of 10.
  - (d) The total value is a multiple of 15.
  - (e) One of the coins is worth exactly twice as much as the other.
  - (f) The total is a multiple of 10, given that the quarter was chosen.
  - (g) The total is a multiple of 15, given that the quarter was chosen.
  - (h) The total is not a multiple of 5, given that the quarter was chosen.
4. Two wheels of chance are spun. The first is marked with a red 1, a blue 2, a red 3, and a blue 4. The second is marked with a red 1, a blue 1, and a red 2. List the elements in a uniform sample space and compute the probabilities of the following events:
  - (a) The two numbers are equal.
  - (b) The two numbers are the same color.
  - (c) At least one of the numbers is blue.
  - (d) Both of the numbers are blue.

1.  $SS = \{(1, 1), (1, 2), (1, 3), (2, 1), (2, 2), (2, 3), (3, 1), (3, 2), (3, 3), (4, 1), (4, 2), (4, 3)\}$ , with 12 outcomes in it
  - (a)  $6/12$
  - (b)  $2/12$
  - (c)  $3/12$
  - (d)  $9/12$
  - (e)  $8/12$
  - (f)  $2/4$
  - (g)  $4/4 = 1$
  - (h)  $1/3$
2.  $SS = \{(1, 1), (1, 2), (1, 3), (1, 4), (2, 1), (2, 2), (2, 3), (2, 4), (3, 1), (3, 2), (3, 3), (3, 4), (4, 1), (4, 2), (4, 3), (4, 4), (5, 1), (5, 2), (5, 3), (5, 4), (6, 1), (6, 2), (6, 3), (6, 4)\}$ , having 24 outcomes in it
  - (a)  $6/24$
  - (b)  $4/24$
  - (c)  $9/24$
  - (d)  $6/24$
  - (e)  $9/24$
  - (f)  $0$
  - (g)  $3/14$
3.  $SS = \{\text{penny} + \text{nickel}, \text{penny} + \text{dime}, \text{penny} + \text{quarter}, \text{penny} + \text{half dollar}, \text{penny} + \text{Susan B}, \text{nickel} + \text{dime}, \text{nickel} + \text{quarter}, \text{nickel} + \text{half dollar}, \text{nickel} + \text{Susan B}, \text{dime} + \text{quarter}, \text{dime} + \text{half dollar}, \text{dime} + \text{Susan B}, \text{quarter} + \text{half dollar}, \text{quarter} + \text{Susan B}, \text{half dollar} + \text{Susan B}\}$ , for 15 outcomes
  - (a)  $11/15$
  - (b)  $3/15$
  - (c)  $4/15$
  - (d)  $6/15$
  - (e)  $3/15$
  - (f)  $1/5$
  - (g)  $2/5$
  - (h)  $1/5$
4.  $SS = \{(\text{red1}, \text{red1}), (\text{red1}, \text{blue1}), (\text{red1}, \text{red2}), (\text{blue2}, \text{red1}), (\text{blue2}, \text{blue1}), (\text{blue2}, \text{red2}), (\text{red3}, \text{red1}), (\text{red3}, \text{blue1}), (\text{red3}, \text{red2}), (\text{blue4}, \text{red1}), (\text{blue4}, \text{blue1}), (\text{blue4}, \text{red2})\}$ , for 12 outcomes
  - (a)  $3/12$
  - (b)  $6/12$
  - (c)  $8/12$
  - (d)  $2/12$