### Exercises 4.2 (I changed the word “reading” to “value on #6 from the original problem set because it was confusing)

1. A ball is drawn randomly from a jar containing 6 red marbles, 2 white marbles, and 5 yellow marbles. Find the probability of:
   1. Drawing a white marble.
   2. Drawing a red marble.
   3. Drawing a green marble.
   4. Drawing two yellow marbles if you draw with replacement.
   5. Drawing first a red marble then a white marble if marbles are drawn without replacement.

Answers:

a. 2/13

b. 6/13

c. 0

d. 25/169

e. 1/13

1. Compute the probability of tossing a six-sided die and getting
   1. an even number.
   2. a number less than 3.

Answers:

a. ½

b. 1/3

1. Compute the probability of rolling a 12-sided die and getting
   1. a number other than 8.
   2. a 2 or 7.

Answers:

a. 11/12

b. 1/6

1. A six-sided die is rolled twice. What is the probability of getting
   1. a 6 on both rolls?
   2. a 5 on the first roll and an even number on the second roll?

Answers:

a. 1/36

b. 1/12

1. Suppose that 21% of people own dogs. If you pick two people at random, what is the probability that neither own a dog?

Answer: 6241/10,000

1. At some random moment, you look at your clock and note the minutes value.
   1. What is probability the minutes value is 15?
   2. What is the probability the minutes value is 15 or less?

Answers:

a. 1/60

b. 1/4

1. What is the probability of flipping a coin three times
   1. and getting a head each time?
   2. not getting a head at all?

Answers:

a. 1/8

b. 1/8

1. What is the probability of rolling two six-sided dice
   1. and getting a sum greater than or equal to 7?
   2. getting an even sum or a sum greater than 7?

Answers:

a. 7/12

b. 2/3

9. A box contains four black pieces of cloth, two striped pieces, and six dotted pieces. A piece is selected randomly and then placed back in the box. A second piece is selected randomly. What is the probability that

a. both pieces are dotted?

b. the first piece is black and the second piece is dotted?

c. one piece is black and one piece is striped?

Answers:

a. ¼

b. 1/6

c. 1/18

Added exercises

### 4.2

10. Compute the probability of rolling five six-sided fair (each side has equal probability of landing face up on each roll) dice and getting

1. a 3 on all five dice.
2. at least one of the die shows a 3.

Answers:

1. 1/7776
2. We find 1-P(no 3s).   4651/7776

11. If you pick a card from a standard deck of 52 cards, what is the probability of getting

1. a 7?
2. a club?
3. a spade or a club?
4. a diamond or a 5?

Answers:

1. 4/52=1/13
2. 13/52=¼
3. 26/52=½
4. 16/52=4/13

12. A box of chocolates contains 7 dark chocolate pieces and3 milk chocolate pieces (and no others). If you randomly pick 2 pieces and eat each chocolate after choosing it, what is the probability of choosing at least one dark chocolate? Write the probability in all three forms.

Answer: We find 1 - P(no dark chocolates). 84/90=14/15 approximately 0.933 = 93.3% Note: I want some of our answers to show all three forms, but only if we can use the approximately equal to symbol as appropriate in the OER. We can do this only for problems with exact values if we are not able to use the approximately equal to symbol in the OER. I’m guessing this won’t be an issue, but I want to make sure anything we add to the OER has proper notation.

13. A bag contains 3 green marbles, 4 red marbles, and 5 blue marbles (and no others). If you randomly pull out three marbles all at once, what is the probability that you choose 3 blue marbles? Write the probability in all three forms.

Answer: 60/1320=1/22 approximately .045=4.5%

14. A bag contains 3 green marbles, 4 red marbles, and 5 blue marbles (and no others). If you randomly pull out a marble and put the marble back 3 times, what is the probability that you pull out a blue marble all 3 times? Write the probability in all three forms.

Answer:125/1728 approximately 0.072=7.2%

15. A bag contains 3 green marbles, 4 red marbles, and 5 blue marbles (and no others). If you randomly pull out three marbles all at once, what is the probability that you choose at least 1 blue marble? Write the probability in all three forms.

Answer: We find 1 - P(no blue marbles).  1110/1320=37/44 approximately 0.84=84%