

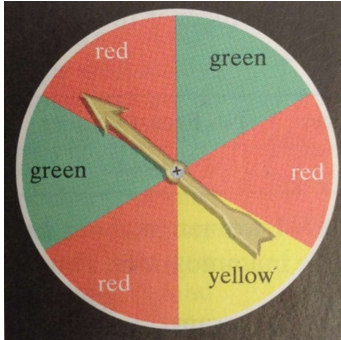
Homework 2.7

Name _____

Exercises 1-26 involve probabilities with events.

Use the spinner shown to solve Exercises 1-10. It is equally probable that the pointer will land on any one of the six regions. If the pointer lands on a borderline, spin again. If the pointer is spun twice, find the probability it will land on

1. Yellow and then green.
2. Red and then red.
3. A color other than green each time.



If the pointer is spun three times, find the probability it will land on

4. A red and then red and then green.
5. Green every time.

In Exercises 6 and 7, a single die is rolled twice. Find the probability of rolling

6. A 5 the first time and a 1 the second time.
7. An odd number the first and a number less than 3 the second time.

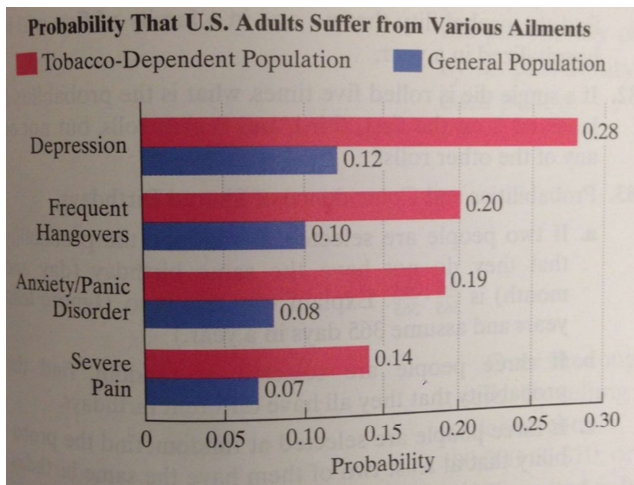
In Exercises 8-10, draw one card from a 52-card deck. Then the card is replaced in the deck, the deck is shuffled, and you draw again. Find the probability of drawing

8. A jack the first time and a club the second time.
9. A 3 each time.
10. A black card each time.
11. If you toss a fair coin seven times, what is the probability of getting all tails?

For Exercise 12, a coin is tossed and a die is rolled. Find the probability of getting

12. A tail and a number less than 5.
13. The probability that a region prone to flooding will flood in any single year is $\frac{1}{10}$.
 - a. What is the probability of two years in a row?
 - b. What is the probability of flooding in three consecutive years?
 - c. What is the probability of no flooding for ten consecutive years?
 - d. What is the probability of flooding at least once in the next ten years?

The graph shows that U.S. adults dependent on tobacco have a greater probability of suffering from some ailments than the general adult population. When making two or more selections from populations with large numbers, such as the U.S. adult population or the population dependent on tobacco, we assume that each selection is independent of every other selection. In Exercises 14-16, assume that the selections are independent events.



14. If two adults are randomly selected from the population of cigarette smokers, what is the probability that they both suffer from depression?
15. If three adults are randomly selected from the general population, what is the probability that they all suffer from frequent hangovers?
16. If three adults are randomly selected from the population of cigarette smokers, what is the probability, expressed as a decimal correct to four places, that at least one person suffers from severe pain?

Exercises 17-24 involve probabilities with dependent events.

In Exercises 17 and 18, we return to our box of chocolates. There are 30 chocolates in the box, all identical shaped. Five are filled with coconut, 10 with caramel, and 15 are solid chocolate. You randomly select one piece, eat it and then select a second piece. Find the probability of selecting

17. Two caramel-filled chocolates in a row.
18. A coconut-filled chocolate followed by a solid chocolate.

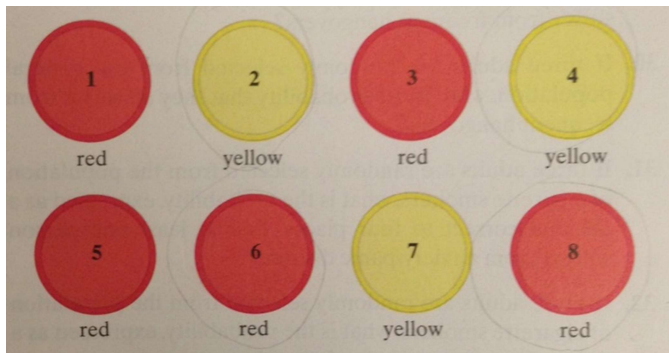
In Exercises 19-21, consider a political discussion group consisting of 5 Democrats, 6 Republicans, and 4 Independents. Suppose that two group members are randomly selected, in succession, to attend a political convention. Find the probability of selecting

19. Two Republicans.
20. An Independent and then a Democrat.
21. No Democrats.

In Exercises 22-24, an ice chest contains six cans of apple juice, eight cans of grape juice, four cans of orange juice, and two cans of mango juice. Suppose that you reach into the container and randomly select three cans in succession. Find the probability of selecting

22. Three cans of grape juice.
23. A can of apple juice, then a can of grape juice, then a can of orange juice.
24. No apple juice.

In Exercises 25-28, the numbered disks shown are placed in a box and one disk is selected at random.



Find the probability of selecting

25. A 7, given that a yellow disk is selected.
26. An odd number, given that a red disk is selected.
27. A yellow disk, given that an odd number is selected.
28. A yellow disk, given that the number selected is at most 3.

The table shows the outcome of car accidents in Florida for a recent year by whether or not the driver wore a seat belt. Use the data to solve Exercises 29 and 30. Express probabilities as fractions and as decimals rounded to the three place.

CAR ACCIDENTS IN FLORIDA			
	Wore Seat Belt	No Seat Belt	Total
Driver Survived	412,368	162,527	574,895
Driver Died	510	1601	2111
Total	412,878	164,128	577,006

Source: Alan Agresti and Christine Franklin, *Statistics*, Prentice Hall, 2007

29. Find the probability of not surviving a car accident, given that the driver did not wear a seat belt.
30. Find the probability of not wearing a seat belt, given that a driver did not survive a car accident.

In Exercises 31-36, we return to the table showing the distribution by marital status and gender, of the 212.5 million Americans ages 18 or older.

MARITAL STATUS OF THE U.S. POPULATION, AGES 18 OR OLDER, IN MILLIONS					
	Never Married	Married	Widowed	Divorced	Total
Male	28.6	62.1	2.7	9.0	102.4
Female	23.3	62.8	11.3	12.7	110.1
Total	51.9	124.9	14.0	21.7	212.5

Source: U.S. Census Bureau

If one person is selected from the population described in the table, find the probability, expressed as a decimal rounded to three places, that the person

31. *Is not widowed.*
32. *Had never been married or is divorced.*
33. *Is female or divorced.*
34. *Is female, given that this person is divorced.*
35. *Is divorced, given that this person is a man.*
36. *Had never been married or is married, given that this person is a woman.*