pg. 42 #2-26 even 27-37

2. total = 268

$P(1) = \frac{42}{268} = \frac{21}{134} = .16$

$P(2) = \frac{44}{268} = \frac{22}{134}$ .16

$P(3) = \frac{45}{268} = .17$

$P(4) = \frac{44}{268} = \frac{22}{134} = .16$

$P(5) = \frac{47}{268} = .18$

$P(6) = \frac{46}{268} = \frac{23}{134}$

6. total = 100

$P(\text{red}) = \frac{30}{100} = \frac{3}{10} = 30\%$

10. total = 125

$P(\text{green}) = \frac{48}{125} = 38.4\%$

16. sample space is gene combination from parents
{Gg, Gg, Gg, Gg}
left on top is dominant. All in sample space have dominant trait.

$\frac{4}{4} = 1 = 100\%$

18. $A\ \text{green} = \pi(1.5)^2 (+ \pi(4.5^2) - \pi(3)^2)$

$2.25\pi + 20.25\pi - 9\pi$

$22.5\pi - 9\pi$

13.5π

$P(\text{green}) = \frac{13.5}{36} = 37.5\%$

$A\ \text{total} = \pi(6)^2$

$= 36\pi$

$\frac{1}{3}$ broken & $\frac{2}{3}$ not broken.

22. Use GC & random integer generator
7-9 for broken 1-6 for not broken
Use rand & make a table
(Yours will be different from mine)

593	930	(556)	981
966	(220)	759	(342)
(502)	851	491	868
(654)	409	478	(621)

$\frac{6}{20} = 30\%$

circle groups of 3 with only unbroken eggs
(# ≤ 6)

24. All students - students outside Venn Diagram
$147 - 31 = 116$
$P(M \text{ or } S) = \frac{116}{147} = 78.9\%$

28. $P(5) = \frac{1}{6}$

34. 3, 6 & 9 are multiples of 3
$\frac{3}{9} = \frac{1}{3}$

1. $\frac{161}{340}$ or about 47%; $\frac{179}{340}$ or about 53%

2. the number 1: $\frac{21}{134}$, or about 15.7%; the number 2: $\frac{11}{67}$ or about 16.4%; the number 3: $\frac{45}{268}$ or out 16.8%; the number 4: $\frac{11}{67}$ or about 16.4%; the number 5: $\frac{47}{268}$ or about 17.5%; the number 6: $\frac{23}{134}$ or about 17.2%

3. Answers may vary. Sample: Generate random numbers between 0 and 1 using a graphing calculator. In each random number, examine the first five digits. Let even digits represent correct answers and odd digits incorrect answers. If there are two or more even digits, make a tally mark for that number. Do this 100 times. Find the total number of tally marks. This, as a percent, gives the experimental probability. The simulated probability should be about 70%.

4. Answers may vary. Sample: Toss 5 coins. Keep a tally of the times 3 or more heads are tossed. (A head represents a correct answer.) Do this 100 times. The total number of tally marks, as a percent, gives the experimental probability. The simulated probability should be about 40%.

5. Answers may vary. Sample: Generate 100 random numbers with a calculator. Record the first five digits of each number. Let 0 and 1 represent correct answers and the other digits incorrect answers. Tally the recorded numbers with exactly one digit that represents a correct answer. Tally the recorded numbers with exactly two digits that represent correct answers. Tally the recorded numbers with exactly three digits that represent correct answers. The tally totals, as a percent, give the experimental probabilities. They should be about 40%, 20%, and 5%, respectively.

6. $\frac{3}{10}$, or 30%
7. $\frac{1}{2}$, or 50%
8. $\frac{4}{5}$, or 80%
9. $\frac{4}{5}$, or 80%
10. $\frac{48}{125}$, or 38.4%
11. $\frac{19}{125}$, or 15.2%
12. $\frac{103}{125}$, or 82.4%
13. $\frac{14}{25}$, or 56%
14. $\frac{77}{125}$, or 61.6%

15. $\{Gg, Gg, gg, gg\}$; $\frac{1}{2}$, or 50%

16. $\{Gg, Gg, Gg, Gg\}$; 1, or 100%

17. $\frac{1}{16}$, or 6.25%
18. $\frac{3}{8}$, or 37.5%
19. $\frac{1}{4}$, or 25%
20. $\frac{3}{4}$, or 75%

21. **a.** 1
b. 0

22. Answers may vary. Sample: Let the digits 1–6 correspond to good eggs, and 7–9 correspond to bad eggs. Ignoring the digit 0, start in the first row of the table. Circle groups of three digits, 20 groups in all. Tally the circled groups that do not have a 7, 8, or 9. The experimental probability of getting 3 cartons with only unbroken eggs is $\frac{5}{20}$, or $\frac{1}{4}$.

Skip

23. Answers may vary. Sample: Let odd digits represent heads and even digits represent tails. Use the first 50 digits of the table. The experimental probability of heads is $\frac{1}{2}$.

24. $\frac{116}{147}$, or 78.9%
25. $\frac{52}{147}$, or 35.4%
26. $\frac{43}{147}$, or 29.3%
27. $\frac{31}{147}$, or 21.1%
28. $\frac{1}{6}$
29. $\frac{1}{2}$
30. $\frac{2}{3}$
31. 0
32. $\frac{1}{6}$
33. 1
34. $\frac{1}{3}$
35. $\frac{4}{9}$
36. $\frac{4}{9}$
37. $\frac{4}{9}$

Name ______________________________ Class ____________________ Date ____________

Theoretical and Experimental Probability

You can collect data through observations or experiments and use the data to state the **experimental probability.**

Alan has a coin. He tosses the coin 100 times and gets 60 heads and 40 tails. The experimental probability of getting heads is:

$$P(\text{heads}) = \frac{\text{number of heads}}{\text{number of trials}} = \frac{60}{100} = 0.6$$

Then Sarita calculated the **theoretical probability** of getting heads on one toss of the coin.

$$P(\text{heads}) = \frac{\text{favorable outcomes}}{\text{number of possible outcomes}} = \frac{1}{2} = 0.5$$

Alan thinks that his coin is unfair since the experimental probability is different from the theoretical probability.

Sarita suggests that they run the experiment again. This time they toss 53 heads and 47 tails. This suggests that the coin is more fair than Alan thinks. To form a more convincing conclusion, they should run the test several more times.

Suppose you have a bag with 75 marbles: 15 red, 5 white, 25 green, 20 black, and 10 blue. You draw a marble, note its color, and then put it back. You do this 75 times with these results: 12 red, 9 white, 27 green, 17 black, and 10 blue. Write each probability as a fraction in simplest form.

	1. P(red)	2. P(white)	3. P(green)	4. P(black)	5. P(blue)
Experimental Probability	15/75 = .2				
Theoretical Probability	12/75 .16				

Suppose you surveyed the students in your class on their favorite juice flavors. Their choices were 6 apple, 10 orange, 1 grapefruit, and 3 mango. Write each probability as a fraction in simplest form. total = 20 students

6. P(apple) 6/20 = .3

7. P(orange) ________

8. P(grapefruit) ________

9. P(mango) ________

Name ____________________ Class ____________ Date ________

Theoretical and Experimental Probability

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Odds
favorable
unfavorable

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	1. P(red)	**2.** P(white)	**3.** P(green)	**4.** P(black)	**5.** P(blue)
Experimental Probability	$\frac{12}{75} = \frac{4}{25}$	$\frac{9}{75} = \frac{3}{25}$	$\frac{27}{75} = \frac{9}{25}$	$\frac{17}{75}$	$\frac{10}{75} = \frac{2}{15}$
Theoretical Probability	$\frac{15}{75} = \frac{1}{5}$	$\frac{5}{75} = \frac{1}{15}$	$\frac{25}{75} = \frac{1}{3}$	$\frac{20}{75} = \frac{4}{15}$	$\frac{10}{75} = \frac{2}{15}$

Suppose you surveyed the students in your class on their favorite juice flavors. Their choices were 6 apple, 10 orange, 1 grapefruit, and 3 mango. Write each probability as a fraction in simplest form.

6. P(apple) $\frac{6}{20} = \frac{3}{10}$

7. P(orange) $\frac{10}{20} = \frac{1}{2}$

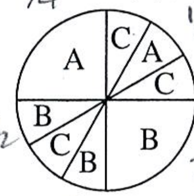
8. P(grapefruit) $\frac{1}{20}$

9. P(mango) 3/20

Name ______________________ Class ______________ Date __________

Practice: Theoretical and Experimental Probability

A dart is thrown at the game board shown. Find each probability.



1. P(A) 4/12 = 1/3 2. P(B) 5/12 3. P(C) 3/12 = 1/4

4. P(not A) 2/3 5. P(not B) 7/12 6. P(not C) 3/4

The odds in favor of winning a game are 5 to 9.

7. Find the probability of winning the game. 5/14

8. Find the probability of *not* winning the game. 9/14

A bag of uninflated balloons contains 10 red, 12 blue, 15 yellow, and 8 green balloons. A balloon is drawn at random. Find each probability. 45 total

9. P(red) 10/45 = 2/9 10. P(blue) 12/45 = 4/15 11. P(yellow) 15/45 = 1/3 12. P(green) 8/45

13. What are the odds in favor of picking a blue balloon? 12/33 = 4/11

14. What are the odds in favor of picking a green balloon? 8/37

15. What is the probability of picking a balloon that is not yellow? 30/45 = 2/3

16. What is the probability of picking a balloon that is not red? 35/45 = 7/9

Solve.

17. a. You are given a ticket for the weekly drawing at the grocery store each time you enter the store. Last week you were in the store once. There are 1,200 tickets in the box. Find the probability and the odds of your winning.

P = 1/1200 odds = 1/1199

b. Find the probability and odds of your winning if you were in the store three times last week and there are 1,200 tickets in the box. P = 3/1200 = 1/400 Odds 3/1197 = 1/399

18. A cheese tray contains slices of Swiss cheese and cheddar cheese. If you randomly pick a slice of cheese, P(Swiss) = 0.45. Find P(cheddar). If there are 200 slices of cheese, how many slices of Swiss cheese are on the tray? P(cheddar) = .55 .45(200) = 90 Swiss

19. For a raffle 10,000 tickets are sold. One ticket is drawn at random to determine a winner. Find the probability and odds of winning. ____________

P = 1/10,000 Odds = 1/9999