NAME_____

Introduction to Probability

Basic Probability Notation

P ( ) = _____

Example:

1. What types of shoes are you wearing today?

Tennis shoes =
Sandals =
Other =

Total =

2. Find...
   a. P (sandals) =

   b. P (tennis shoes) =

   c. P (other) =

3. Based on this information, if Mrs. Thelen sees 110 students today, how many will be wearing sandals?

Theoretical Probability:

Experimental Probability:

Practice Using Experimental and Theoretical Probability

1. Rolling a 6-sided dice 10 times.
    a. What is the theoretical probability of rolling the #5?

    b. What is the experimental probability of rolling the #5?

    c. What is the theoretical probability of rolling a prime number?

    d. What is the experimental probability of rolling a prime number?

2. Drawing from a deck of cards 10 times.
    a. a. What is the theoretical probability of drawing a heart?

    b. What is the experimental probability of drawing a heart?

    c. What is the theoretical probability of drawing a king?

    d. What is the experimental probability of drawing a king?

Partner #1_____

Partner #2_____

Probability
"Rolling Dice" Station

Roll a pair of dice twenty times and create a tally of the sums in the table below. Then use your results to answer the questions.

Sum	1	2	3	4	5	6	7	8	9	10	11	12
Tally												
Total												

1. What is the theoretical probability of rolling a sum of 6?

2. What is the experimental probability of rolling a sum of 6?

3. What is the theoretical probability of rolling a sum of 5 or less?

4. What is the experimental probability of rolling a sum of 5 or less?

5. The sums of 6, 7, and 8 are more theoretically probable than the other sums.
   a. Why would these sums be more likely to occur than the others?

   b. Did your experimental probability show this to be true? Why or why not?

Partner #1_____

Partner #2_____

Probability
"Spinner" Station

Spin the spinner twenty times and create a tally of your results in the table below. Then use your results to answer the questions.

Color	Red	Green	Blue
Tally			
Total			

1. What is the theoretical probability of spinning green?

2. What is the experimental probability of spinning green?

3. What is the theoretical probability of spinning red?

4. What is the experimental probability of spinning red?

5. How could you redraw the spinner to make blue equally probable to red without changing the probability of green? Draw a picture of what this new spinner would look like.

Partner #1_____

Partner #2_____

Probability
"Flipping Coins" Station

Flip one coin two times. Repeat this 20 times. Tally your results in the table below. Then use your results to answer the questions. Be sure to note the difference between flipping heads, then tails (HT) compared to flipping tails first and then heads (TH).

Possible Outcomes	HH	HT	TH	TT
Tally				
Total				

1. What is the theoretical probability of flipping two tails?

2. What is the experimental probability of flipping two tails?

3. What is the theoretical probability of flipping any combination of heads and tails?

4. What is the experimental probability of flipping any combination of heads or tails?

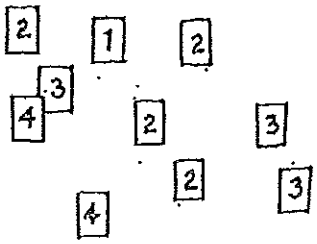
6. a. Theoretically, are you more likely to get a pair (HH or TT) or a combination (HT or TH)?

   b. Did your results show this to be true? Why or why not?

Name _____

Enrichment Worksheet for 390 – 391

Imagine thoroughly shuffling each deck of cards and then picking a card. Give each probability in lowest terms.

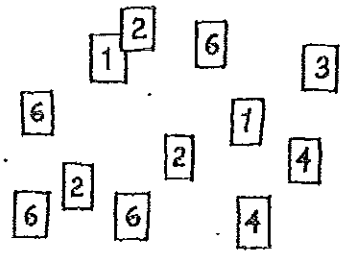
1. 

a. $P(1) =$ ____ b. $P(2) =$ ____

c. $P(3) =$ ____ d. $P(4) =$ ____

e. $P(\text{not } 4) =$ ____ f. $P(\text{not } 1) =$ ____

g. $P(\text{not } 3) =$ ____ h. $P(\text{not } 2) =$ ____

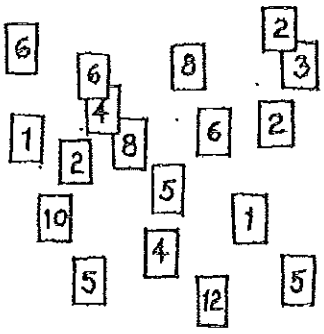
2. 

a. $P(1) =$ ____ b. $P(2) =$ ____

c. $P(3) =$ ____ d. $P(5) =$ ____

e. $P(\text{not } 4) =$ ____ f. $P(\text{not } 5) =$ ____

g. $P(\text{prime number}) =$ ____ h. $P(\text{composite number}) =$ ____

3. 

a. $P(6) =$ ____ b. $P(9) =$ ____

c. $P(\text{not } 1) =$ ____ d. $P(\text{not } 7) =$ ____

e. $P(8) =$ ____ f. $P(\text{not } 8) =$ ____

g. $P(\text{prime number}) =$ ____ h. $P(\text{composite number}) =$ ____

i. $P(\text{not a prime}) =$ ____ j. $P(\text{not a composite}) =$ ____

k. $P(\text{multiple of } 2) =$ ____ l. $P(\text{multiple of } 5) =$ ____

m. $P(\text{factor of } 12) =$ ____ n. $P(\text{factor of } 20) =$ ____

o. $P(\text{not a factor of } 8) =$ ____ p. $P(\text{not a multiple of } 4) =$ ____

Integrated 2 Name: _____

Simple Probability

1) What does P(some event happening) = 0 mean?

2) What does P(some event happening) = 1 mean?

3) The owner of Pizza Palace kept track of the types of crusts used for the last 1000 pizza orders.

Thin Crust	540	Thick Crust	285
Pan Crust	138	Stuffed Crust	37

a. What is the probability that the next customer will order thick crust? Find P(Thick Crust) Show your work.

b. Find P(Pan Crust). Show your work.

c. Find P(NOT Stuffed Crust). Show your work.

d. Based on this information, of the next 200 pizzas ordered, how many will have THIN Crusts? Show your work.

4) Assume that you roll a fair die. (All numbers 1 - 6 are equally likely to be rolled.) Find each probability.

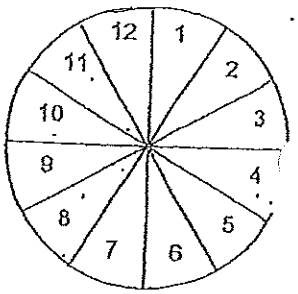
a. P(Three)

b. P(Two or Five)

c. P(Even Number)

d. P(NOT One or Four)

6). The spinner to the right is spun one time.
Find each probability.



a. P(Even Number)

b. P(Multiple of Four)

c. P(NOT 5)

d. P(1, or 5, or 7)

5) There are _____ cards in a standard deck of playing cards.
There are _____ cards in each suit. (Hearts, Diamonds, Spades, Clubs)

7) Assume that one card is drawn at random from the deck. Find each probability.

a. P(Queen of Diamonds)

b. P(Any Queen)

c. P(Spade)

d. P(NOT a Club)

e. P(4 of Hearts or a Diamond)

f. P(Ace or a Jack)

8) A vending machine has 5 different types of beverages. The owner of the machine kept track of the last 2,000 sales.

Fruit Punch	746	Aloha Punch	524
Apple Juice	98	Orange Juice	282
CranApple Juice	350		

a. What is the probability that the next can bought from this machine will be Aloha Punch? P(Aloha Punch)

b. P(Any Juice)

c. P(Apple Juice or Aloha Punch)

Integrated 2

Name _____

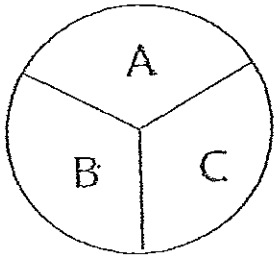
Dart Boards

A dart is randomly thrown at a dartboard. Write the probabilities as a fraction first, then a percent if you'd like.

1) P (A)

2) P (NOT A)

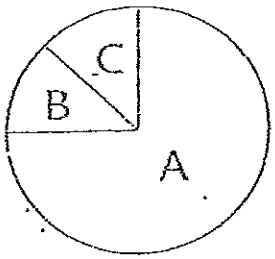
3) P (A or B)



4) P (A)

5) P (B or C)

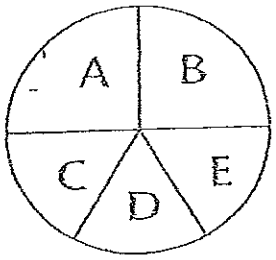
6) P (NOT B)



7) P (A)

8) P (C)

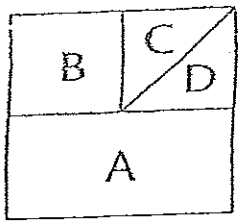
9) P (C or D)



10) P (A)

11) P (D or C)

12) P (NOT D)

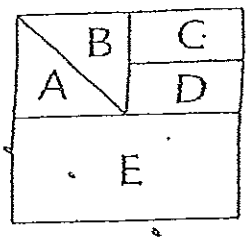


13) P (E)

14) P (A or B)

15) P (A)

16) P (A or D)



17) If you were playing darts and someone agreed to pay you $10.00 for hitting section B, which one of the 5 dartboards from above would you want to use? Why?

Slips of paper are numbered from 1-25 and placed in a hat. One strip is drawn at random. Each strip is replaced before the next number is drawn. Write the probabilities as a fraction first, then a percent if you'd like.

18) P (even number)

19) P (more than 20)

20) P (less than 5 or more than 20)

21) P (prime number)

22) P (multiple of 5)

23) P (prime and less than 10)

24) P (odd number and greater than 15)

Name _____ Class _____ Date _____

Practice 12-7 Experimental Probability

The table shows the colors of Rahmi's soccer shirts. For each color, find the experimental probability that a random shirt from Rahmi's collection is that color. Write the probability as a percent, to the nearest tenth of a percent.

Color	Number of shirts
red	6
white	4
orange	3
blue	2

1. red _____ 2. white _____

3. orange _____ 4. blue _____

5. red or blue _____ 6. not white _____

7. not orange or red _____ 8. green _____

Your school's basketball team has an equal chance of winning or losing the first three games of the season. You simulate the probability by tossing a coin 60 times, letting heads stand for a win and tails stand for a loss. Use the data below. Find each experimental probability as a percent.

HHH THH THT TTH THH
HTH THH THH HTH HHH
THH TTH THH HTT TTT
HTT HHT TTH HTH THH

9. P(win all 3) _____ 10. P(win exactly 2) _____

11. P(win exactly 1) _____ 12. P(win none) _____

13. P(win at least 2) _____ 14. P(win at least 1) _____

15. P(win less than 2) _____

Students were surveyed about the number of children living in their household. The table shows the results. Write each experimental probability as a fraction in simplest form.

Number of children	Number of students
0	0
1	11
2	15
3	3
4 or more	4

16. P(one child) _____

17. P(2 or more children) _____

18. P(at least 3 children) _____