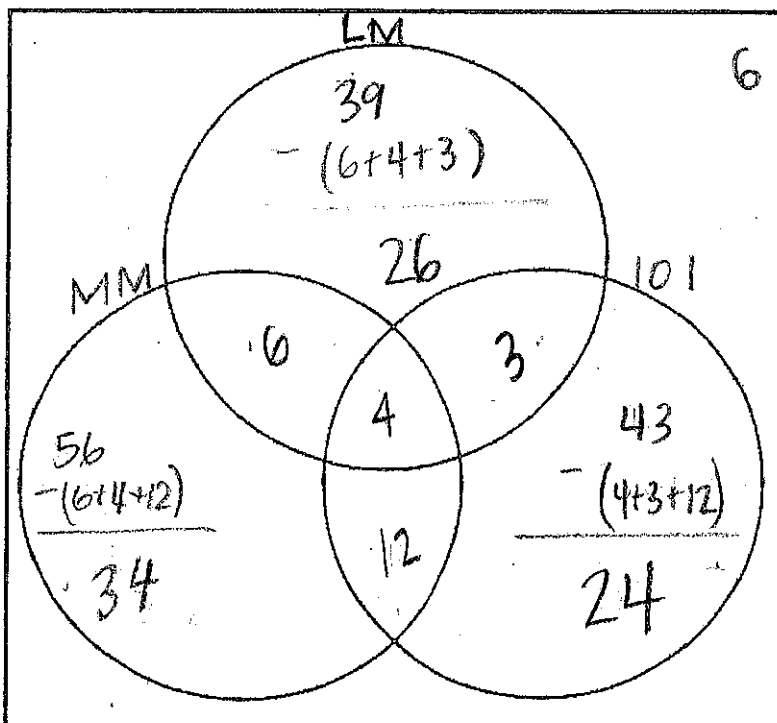


Name: \_\_\_\_\_ Hour: \_\_\_\_\_

## Algebra II: Venn Diagrams

1. In a survey of children who saw three different shows at Walt Disney World, the following information was gathered:

- 39 children liked *The Little Mermaid*
- 43 children liked *101 Dalmatians*
- 56 children liked *Mickey Mouse*
- 7 children liked *The Little Mermaid* and *101 Dalmatians*
- 10 children liked *The Little Mermaid* and *Mickey Mouse*
- 16 children liked *101 Dalmatians* and *Mickey Mouse*
- 4 children liked *The Little Mermaid*, *101 Dalmatians*, and *Mickey Mouse*
- 6 children did not like any of the shows



Answer the following questions:

- How many students were surveyed?  $26 + 6 + 4 + 3 + 12 + 34 + 24 + 6 = 115$
- How many liked *The Little Mermaid* only? 26
- How many liked *101 Dalmatians* only? 24
- How many liked *Mickey Mouse* only? 34

## Practice 1: Independent and Dependent Events

A shelf holds 3 novels, 2 biographies, and 1 history book. Two students in turn choose a book at random. What is the probability that the students choose each of the following?

1. both novels  $\frac{1}{2} \cdot \frac{2}{5} = \frac{1}{5}$       2. both biographies  $\frac{1}{3} \cdot \frac{1}{5} = \frac{1}{15}$
3. a history, then a novel  $\frac{1}{6} \cdot \frac{3}{5} = \frac{1}{10}$       4. both history books  $0$

Meg flipped a penny the given number of times. What is the probability the results were as follows?

5. 2; two heads  $\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$       6. 3; three tails  $\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{8}$
7. 2; a tail, then a head  $\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$       8. 5; five tails  $\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{32}$

Two puppies are chosen at random from a box at the mall. What is the probability of these outcomes?

9. both black  $\frac{3}{4} \cdot \frac{2}{11} = \frac{6}{44} = \frac{3}{22}$       10. both brown  $\frac{1}{4} \cdot \frac{2}{11} = \frac{1}{22}$
11. a setter, then a hound  $\frac{1}{3} \cdot \frac{3}{11} = \frac{1}{11}$
12. a retriever, then a setter  $\frac{5}{12} \cdot \frac{4}{11} = \frac{5}{33}$       13. both setters  $\frac{1}{3} \cdot \frac{2}{11} = \frac{1}{11}$

**Free Puppies for Adoption!**

5 black retrievers      9 black  
3 brown hounds  
4 black setters

Are the events independent or dependent? Explain.

14. A guest at a party takes a sandwich from a tray. A second guest then takes a sandwich.

dependent. There are less sandwiches for the second person.

15. Sam flips a coin and gets heads. He flips again and gets tails.

independent. The coin always has 2 sides

You can select only two cards from the right. Find the probability of selecting a T and an N for each condition.

M	A	T	H
I	S		
F	U	N	

16. You replace the first card before drawing the second.

$\frac{1}{9} \cdot \frac{1}{9} = \frac{1}{81}$

17. You do not replace the first card before drawing the second.

$\frac{1}{9} \cdot \frac{1}{8} = \frac{1}{72}$

## Practice 2: Independent and Dependent Events

A bag contains 3 black and 2 white marbles. A marble is drawn at random and then replaced. Find each probability.

1.  $P(2 \text{ blacks}) = \frac{3}{5} \cdot \frac{3}{5} = \frac{9}{25}$
2.  $P(\text{black, white}) = \frac{3}{5} \cdot \frac{2}{5} = \frac{6}{25}$
3.  $P(\text{white, black}) = \frac{2}{5} \cdot \frac{3}{5} = \frac{6}{25}$
4.  $P(2 \text{ whites}) = \frac{2}{5} \cdot \frac{2}{5} = \frac{4}{25}$

Each letter from the word MISSISSIPPI is written on a separate slip of paper. The 11 slips of paper are placed in a sack and two slips are drawn at random. The first pick is not replaced.

5. Find the probability that the first letter is M and the second letter is I.  $\frac{1}{11} \cdot \frac{2}{5} = \frac{2}{55}$
6. Find the probability that the first letter is I and the second letter is P.  $\frac{4}{11} \cdot \frac{1}{5} = \frac{4}{55}$
7. Find the probability that the first letter is S and the second letter is also S.  $\frac{4}{11} \cdot \frac{3}{10} = \frac{6}{55}$

Solve.

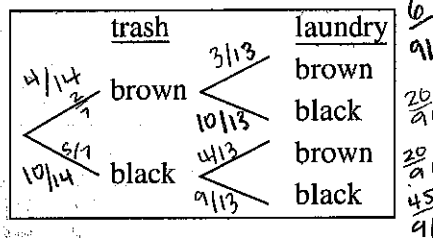
8. On a TV game show, you can win a car by drawing two aces from a standard deck of cards. The first card is not replaced. What is your probability of winning?  
 $\frac{1}{13} \cdot \frac{1}{17} = \frac{1}{221}$
9. You roll a number cube eight times, and each time you roll a 4. What is the probability that on the ninth roll, you will roll a 6?  
 $\frac{1}{6}$

10. Two letters of the alphabet are chosen randomly without replacement. Find each probability.

- a.  $P(\text{both vowels}) = \frac{5}{26} \cdot \frac{4}{25} = \frac{2}{65}$
- b.  $P(\text{both consonants}) = \frac{21}{26} \cdot \frac{20}{25} = \frac{42}{65}$

11. There are 4 brown shoes and 10 black shoes on the floor. Your puppy carries away two shoes and puts one shoe in the trash can and one shoe in the laundry basket.

- a. Complete the tree diagram to show the probability of each outcome.
- b. What is the probability that there will be a brown shoe in both the trash and the laundry basket?  $\frac{6}{91}$



12. Use the data at the right to find  $P(\text{right-handed male})$  and  $P(\text{left-handed female})$  if one person is chosen at random.

$\frac{43}{50} \cdot \frac{17}{100} = \frac{731}{5000}$

	Male	Female
Right-handed	86	83
Left-handed	14	17
Total	100	100