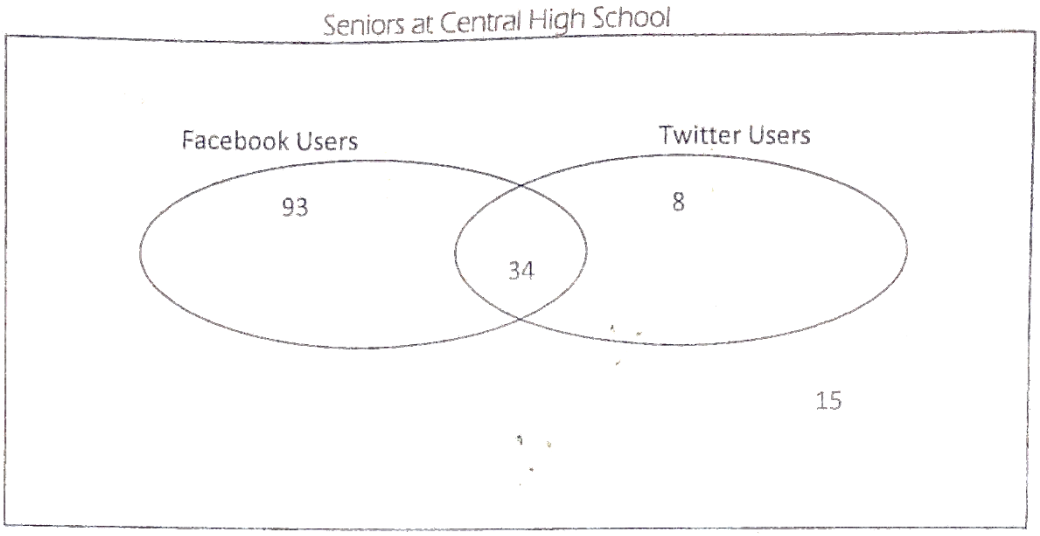
AMDM Unit 2 Review–Probability Name KEY

Use the following Venn diagram to answer #1 – 5. For # 3 – 5, you must show your work.



TOTAL SENIORS
93
+ 34
8
15
150

1. What is the probability that a student is a Facebook user?
A) 0.27 B) 0.62 C) 0.85 D) 0.93

93+34=127 ÷ 150= 0.846

2. What is the probability that a student is not a Twitter user?
A) 0.95 B) 0.72 C) 0.62 D) 0.10

93+15=108 ÷ 150 = 0.72

3. What is the probability that a student is a Facebook user but not a Twitter user?

93 ÷ 150= 0.62 34 is both: using FB and Twitter.

4. What is the probability that a student is neither a Facebook user nor a Twitter user?

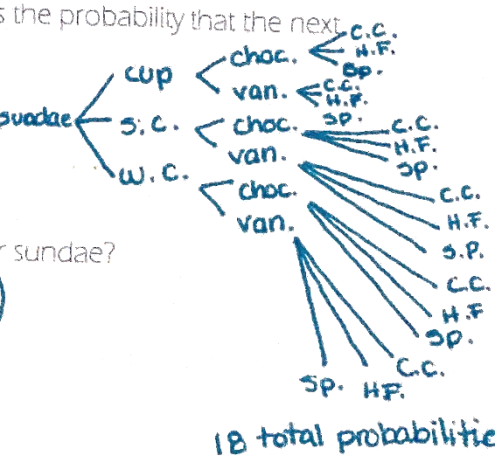
15 ÷150 = 0.10 Outside both circles

5. What is the probability that a student is a Twitter user given that he/she is a Facebook user?

Twitter & FB (Both) ÷ FB + both = 34 ÷ (93+34) = 34 ÷ 127 = 0.267

You are hungry after school and walk to Bruster's to purchase a sundae. You have a choice of a cup, sugar cone, or waffle cone. Ice cream choices are limited to chocolate and vanilla. Topping choices are sprinkles, hot fudge, and crushed cookies. You are limited to one choice per category.

6. If you order a waffle cone sundae with vanilla ice cream and sprinkles, what is the probability that the next person in line orders the exact same sundae?
A) $\frac{1}{18}$ B) $\frac{1}{8}$ C) $\frac{7}{6}$ D) $\frac{1}{3}$



7. What is the probability that your best friend will order crushed cookies on her sundae?
A) $\frac{1}{8}$ B) $\frac{1}{8}$ C) $\frac{7}{6}$ D) $\frac{1}{3}$

$\frac{6}{18} = \frac{1}{3}$

Use the area model below to answer #8.

8. If 50 people are surveyed concerning their recommendations on a new restaurant in Canton Marketplace, how many people would not recommend it?

A) 5 B) 21 C) 25 D) 27

"Y" means "yes, recommend it" and "N" means "no, don't recommend it."

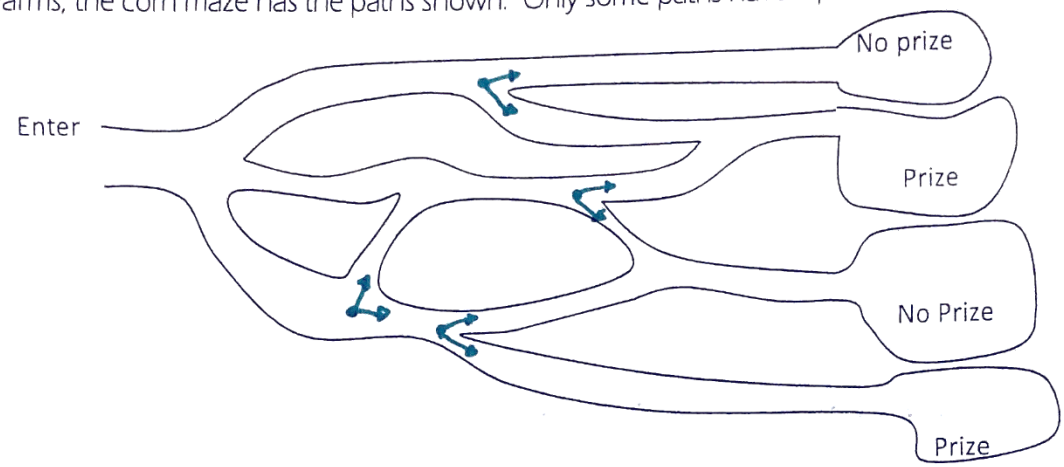
Y		N	Y
N	N	N	Y
N		Y	

12 total probabilities.

N = 6
Y = 6

$N = \frac{6}{12} = \frac{1}{2} \times 50 = 25$

At Yahoo Farms, the corn maze has the paths shown. Only some paths have a prize at the end of the path.



9. If only forward motion is allowed (no backtracking), draw an area model for the corn maze.

NP		P	
P		NP	
P	NP	NP	P

12 total probabilities

NP = 6
P = 6

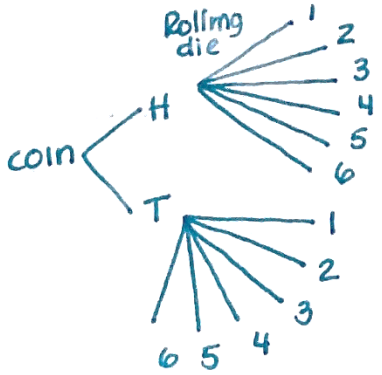
10. What is the theoretical probability of not winning a prize?

P(not winning - NP) $= \frac{6}{12} = \frac{1}{2}$

11. If 200 people go through the maze on a particular weekend, how many prizes should Yahoo Farm expect to give away that weekend? $\frac{1}{2} \times 200 = 100$ prizes that weekend.

Suppose you are playing a game that involves flipping a coin (heads or tails) and rolling a die (1, 2, 3, 4, 5, 6).

12. Make a tree diagram showing all the possible outcomes for this event with probabilities labeled.



coin = $\frac{1}{2}$ probability

Rolling die = $\frac{1}{6}$ probability.

13. What is the probability you would flip a head? $\frac{1}{2}$

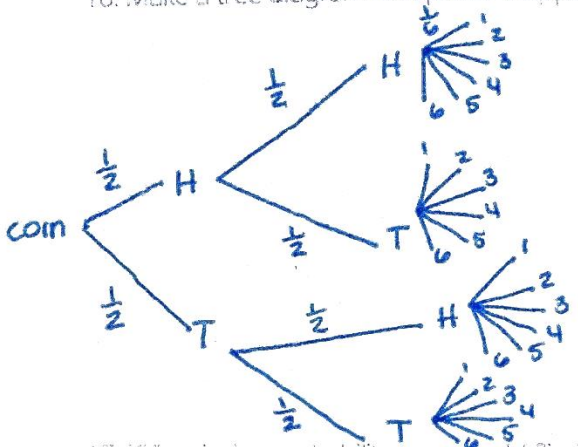
14. What is the probability you would roll a 1 on the die? $\frac{1}{6}$

15. What is the probability you would roll an even number on the die?

$\frac{3}{6} = \frac{1}{2}$

Now consider if you flipped the coin twice then rolled the die.

16. Make a tree diagram to represent flipping the coin twice then rolling the die (flip, flip, roll).



17. What is the probability you would flip 2 heads?

$H_1 = \frac{1}{2}$ $H_2 = \frac{1}{2}$ $P = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

18. What is the probability you would flip a head then a tail?

$P(H \text{ and } T) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

19. What is the probability you would roll an even number?

$P(2 \text{ or } 4 \text{ or } 6) = \frac{3}{6} = \frac{1}{2}$

Julia loves math, so she wants to take a math class in her senior year. The counselor asks her if she prefers a morning or afternoon class. Below is the list of teachers and the period they offer the class. The morning classes are 1st, 2nd, and 3rd and the afternoon classes are 4th, 5th and 6th.

Ms. Estrada: 3rd, 5th and 6th Mr. Lacy: 1st and 2nd Mr. Ayan: 1st, 2nd, 4th, 5th and 6th

20. Create a chart or list that illustrates all of her choices.

	1st	2nd	3rd	4rd	5th	6th
Ms. Estrada			✓		✓	✓
Mr. Lacy	✓	✓				
Mr. Ayan	✓	✓		✓	✓	✓

morning classes afternoon classes.

morning
C. Estrada
Lacy
Lacy
Ayan
Ayan

afternoon
C. Estrada
Estrada
Ayan
Ayan
Ayan

Total 10 prob.

21. Give the probabilities of taking each teacher's class.

P(Estrada) = $\frac{3}{10}$ P(Lacy) = $\frac{2}{10} = \frac{1}{5}$ P(Ayan) = $\frac{5}{10} = \frac{1}{2}$

22. Before deciding on a morning or afternoon class, Julia remembers she wants to take science during 5th period. What is the probability she will be assigned during this time?

Ms. Estrada and Mr. Ayan teach during 5th period. $P(5\text{th Period}) = \frac{2}{10} = \frac{1}{5}$

23. Julia prefers Mr. Ayan. Should she pick the morning or afternoon? EXPLAIN!!

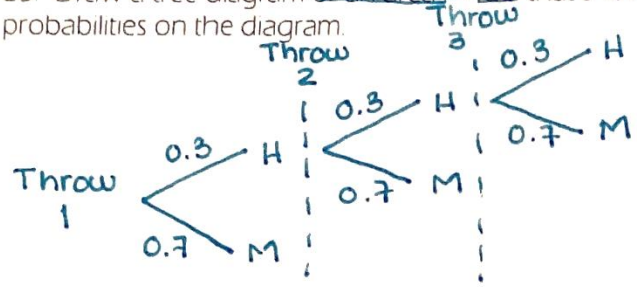
Mr. Ayan teaches 3 afternoon classes, more than the other teachers, so she should pick the afternoon.

24. After checking the schedule, the counselor told Julia that Ms. Estrada's classes start in the morning. How does this information affect the probability of her getting any afternoon class? EXPLAIN!!!

Since Ms. Estrada teaches 2 afternoon classes, now there are two less options Her probability of taking an afternoon class decreases from $\frac{5}{10}$ to $\frac{3}{10}$

Brandon is playing a game at a carnival in which he tries to throw a ball through a small ring three times (three throws is considered playing once). If he makes a shot, he gets another chance, up to a total of three chances. If he makes the first shot, he wins $10; if he makes the second shot, he wins $20; if he makes the third shot, he wins $40. The probability that he hits the target on any shot is 30%.

25. Draw a tree diagram ~~or an area model~~ that shows all the possible outcomes of this game. Include the probabilities on the diagram.



26. What is the probability that Brandon wins $10? $20? $40?

1st throw hits, 2nd throw misses = (0.3)(0.7)=0.21

P(H,H,M) (0.3)(0.3)(0.7)=0.063

P(H,H,H) (0.3)(0.3)(0.3)=0.027

27. How many times should Brandon expect to win $40 if he plays the game 50 times?

50 × P(H,H,H) = 50 × 0.027 = 1.35 or about once every 50 times

28. What is the amount Brandon should "expect" to win if he plays the game once?

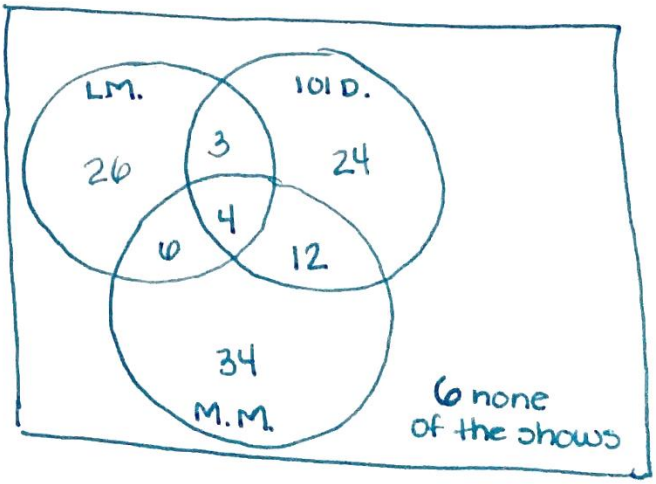
Expected value = H+H+H = $10(0.21) + $20(0.063) + $40(0.027) = 2.1 + 1.63 + 1.08 = $4.81

29. 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:

- Make a Venn diagram in the space on the right.



- How many students were surveyed?

115

- How many liked *The Little Mermaid* only?

26

- How many liked *101 Dalmatians* only?

24

- How many liked *Mickey Mouse* only?

34