

Happy Tuesday! Reflect & Turn in...

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: <u>5 - 14</u> Topic: <u>Counting Techniques</u>	0 1 2	
Tuesday Date: <u>5 - 15</u> Topic: <u>Permutations vs. Combinations</u>	0 1 2	
Wednesday Date: _____ Topic: _____	0 1 2	
Thursday Date: _____ Topic: _____	0 1 2	
Friday Date: _____ Topic: _____	0 1 2	

Class Plan

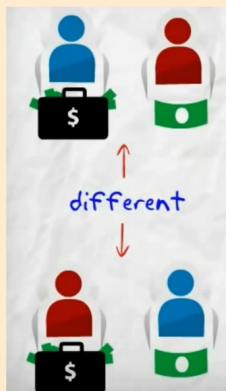
- 1) Warm-up (Homework questions??)
- 2) Review for Quiz 8.1

Youtube Example:

Three 9th graders are going to win a prize of either \$50 or \$5. How many ways can we arrange the two winners?

This video will answer this question...

Three 9th graders are going to win a prize of either \$50 or \$5. How many ways can we arrange the two winners?



PERMUTATION

Order Matters

There are 6
different ways
we could give out
the prizes.

<https://www.youtube.com/watch?v=0NAASclUm4k>

Ahhhh! Don't Memorize!!!



DontMemorise.com

~~Combinations~~

~~$${}^n C_r = \frac{n!}{r!(n-r)!}$$~~

Select



~~Permutations~~

~~$${}^n P_r = \frac{n!}{(n-r)!}$$~~

Arrange

Unit 8 Probability: Quiz 1

Do: Review Handout

- Experimental vs. Theoretical
- Tree Diagram (with or without replacement)
- Analyze a Tree Diagram
- Counting Principle
- Permutation/Combination



When done: Look over any assignments from the week.

Review Handout

1. Ms. Berg flipped a coin 20 times and it landed on heads 12 times.

a) What is the probability of landing on heads, based on this experiment?

$$P(H) = \frac{12}{20}$$

b) If Ms. Berg flipped the coin 100 times, using this probability, how many times would the coin land on heads?

$$\frac{12}{20} = \frac{x}{100}$$

$$x = 60$$

on the
head



c) How many times should Ms. Berg land on heads in theory?

$$\frac{1}{2} = \frac{50}{100}$$

Heads
50 (in theory)

Review Handout

2. Ms. Paulson is rolling two dice with her son. He says that he gets a piece of candy every time a ~~6~~ is rolled. Sum of 6 is rolled.

a) If they roll the dice 50 times, how many pieces of candy should he get?



b) Was this the best number to choose? Why?

Review Handout

3. The table shows data from a survey conducted at 5 schools on the rate of smoking amongst 15-year-old students.

School	No. of 15 year olds		No. of smokers	
	Male	Female	Male	Female
A	45	51	10	11
B	36	42	9	6
C	52	49	13	13
D	28	33	9	10
E	40	39	7	4
<i>Total</i>	201	214	48	44

a) Find the probability that a randomly chosen 15-year-old student at school **C** is a smoker.

b) Find the probability that a randomly chosen 15-year-old student at school **E** is not a smoker.

c) If a 15 year old is chosen at random from the 5 schools, what is the probability that he or she is a smoker?

Review Handout

4. A marble is randomly selected from a box containing 5 green, 3 red, and 7 blue marbles. Determine the probability that the marble is:

- a) Red b) Green or Red c) not red d) Neither green nor blue

Review Handout

5. List all the possible outcomes (sample space).

a) A basketball player takes a shot that can result in a score or a miss.

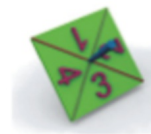
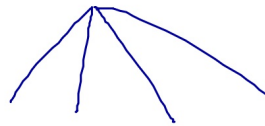
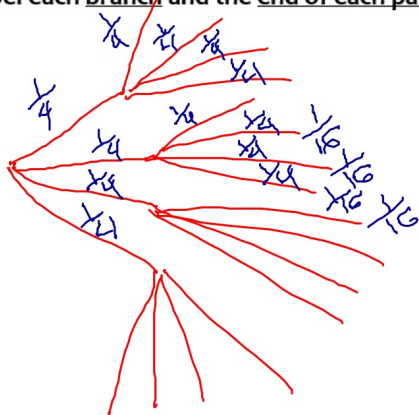
b) Two rooms in a house need to be painted. Each room can be painted white, yellow, or green.

Review Handout

6. Malaya is playing a game that has a spinner with 4 equal sized sections labeled 1, 2, 3, and 4.

Model her first 2 spins using a tree diagram.

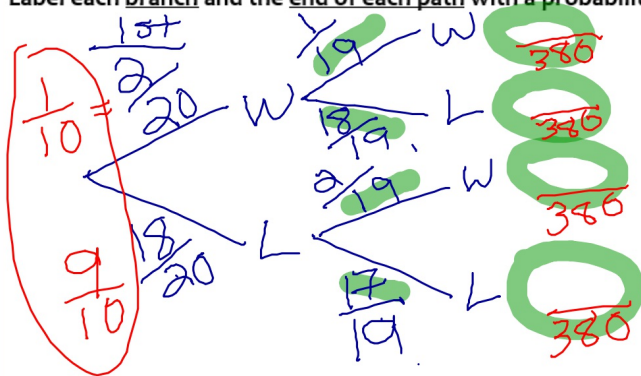
Label each branch and the end of each path with a probability.



What is the probability that her first spin is 2, and her second spin is also 2? **Show work!**

Review Handout

7. Ms. Paulson has an envelope of 2 winning tickets and 18 loser tickets. As she goes around the room students close their eyes and select one of the tickets. Each student gets their own ticket and keeps the ticket. **Model the probability of the first 2 student's choices using a tree diagram. Label each branch and the end of each path with a probability.**



According to your tree diagram what is the probability that the first person and second person choose a winning ticket? **Show work!**

Review Handout

8. Sureya has 4 hijabs, 5 skirts, 6 blouses, and 2 pairs of shoes. Calculate Sureya's total outfits.

9. A password needs 8 characters: Upper case letter, lower case letter, or digits. How many different passwords can be created?

$26 \cdot 26 \cdot 10$
62, 62, 62, 62, 62, 62, 62, 62

$$62^8 = 2.18 \times 10^{14}$$

a a a d d a a a
a d a a a a b

Review Handout Solutions

1. Ms. Berg flipped a coin 20 times and it landed on heads 12 times.

a) What is the probability of landing on heads, based on this experiment?

b) If Ms. Berg flipped the coin 100 times, using this probability, how many times would the coin land on heads?

$$a) \frac{12}{20} = \boxed{\frac{3}{5}} \quad b) \left(\frac{3}{5}\right) \cdot 100 = \frac{300}{5} = \boxed{60}$$



c) How many times should Ms. Berg land on heads in theory?

$\frac{1}{2}$ of the time, or 50 times for 100 flips.

Review Handout Solutions

Sum of

2. Ms. Paulson is rolling two dice with her son. He says that he gets a piece of candy every time 6 is rolled.

a) If they roll the dice 50 times, how many pieces of candy should he get?

$$P(\text{sum of 6}) = \frac{5}{36} = \frac{x}{50} \quad \frac{250}{36} = \frac{36x}{36}$$



b) Was this the best number to choose? Why?

He should have chose $6.94 \approx x$ pieces of candy
a sum of 7

Roll a sum of 6

1,5 5,1
2,4 4,2
3,3

All sums

$6 \times 6 = 36$
1st dice 2nd dice

1,6 6,1
2,5 5,2
3,4 P(sum 7)
4,3 $\left(\frac{6}{36}\right)$

Review Handout Solutions

3. The table shows data from a survey conducted at 5 schools on the rate of smoking amongst 15-year-old students.

School	No. of 15 year olds		No. of smokers	
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A	45	51	10	11
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C	52	49	13	13
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E	40	39	7	4
Total	201	214	48	44

a) Find the probability that a randomly chosen 15-year-old student at school C is a smoker.

$$\frac{13+13}{52+49} = \frac{26}{101}$$

b) Find the probability that a randomly chosen 15-year-old student at school E is not a smoker.

$$40+39 = 79 \text{ students} \quad 79 - (7+4) = 68 \quad \frac{68}{79}$$

c) If a 15 year old is chosen at random from the 5 schools, what is the probability that he or she is a smoker?

$$\frac{48+44}{201+214} = \frac{92}{415}$$

Review Handout Solutions

4. A marble is randomly selected from a box containing 5 green, 3 red, and 7 blue marbles.

Determine the probability that the marble is:

- a) Red $\frac{3}{15} = \frac{1}{5}$ b) Green or Red $\frac{8}{15}$ c) not red $\frac{12}{15} = \frac{4}{5}$ d) Neither green nor blue $\frac{3}{15} = \frac{1}{5}$
- Handwritten notes: "15 marbles total" with an arrow pointing to the denominator of the fractions, and "Neither green nor blue" with an arrow pointing to the fraction $\frac{3}{15}$.*

5. List all the possible outcomes (sample space).

a) A basketball player takes a shot that can result in a score or a miss.

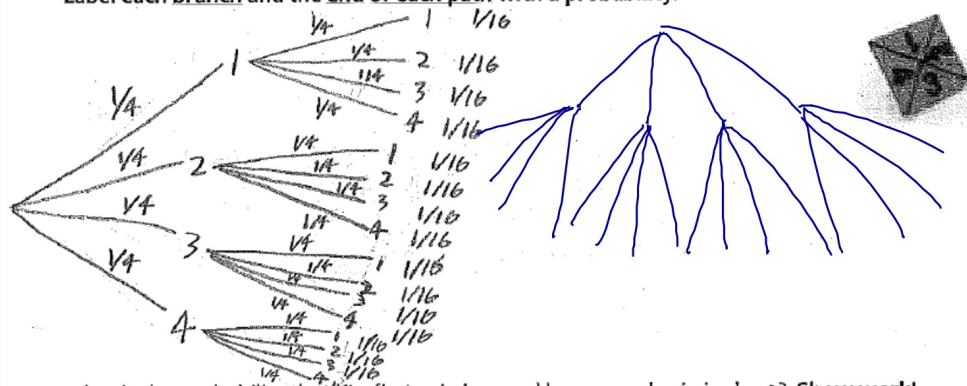
$$S = \{\text{Score, Miss}\}$$

b) Two rooms in a house need to be painted. Each room can be painted white, yellow, or green.

$$S = \{WW, WY, WG, YW, YG, YG, GW, GY, GG\}$$

Review Handout Solutions

6. Malaya is playing a game that has a spinner with 4 equal sized sections labeled 1, 2, 3, and 4. Model her first 2 spins using a tree diagram. Label each branch and the end of each path with a probability.

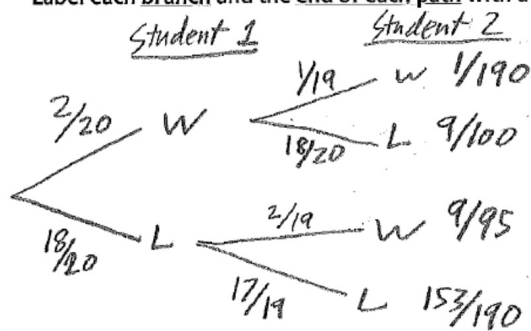


What is the probability that her first spin is 2, and her second spin is also 2? Show work!

$$\frac{1}{4} \times \frac{1}{4} = \frac{2}{16} = \frac{1}{8}$$

Review Handout Solutions

7. Ms. Paulson has an envelope of 2 winning tickets and 18 loser tickets. As she goes around the room students close their eyes and select one of the tickets. Each student gets their own ticket and keeps the ticket. **Model the probability of the first 2 student's choices using a tree diagram. Label each branch and the end of each path with a probability.**



According to your tree diagram what is the probability that the first person and second person choose a winning ticket? **Show work!**

$$\frac{2}{20} \cdot \frac{1}{19} = \frac{2}{380} = \boxed{\frac{1}{190}}$$

Review Handout Solutions

8. Sureya has 4 hijabs, 5 skirts, 6 blouses, and 2 pairs of shoes. Calculate Sureya's total outfits.

$$4 \cdot 5 \cdot 6 \cdot 2 = \boxed{240}$$

9. A password needs 8 characters: Upper case letter, lower case letter, or digits. How many different passwords can be created?

$$\underbrace{62} \cdot \underbrace{62} \cdot \underbrace{62} \cdot \underbrace{62} \cdot \underbrace{62} \cdot \underbrace{62} \cdot \underbrace{62} \cdot \underbrace{62} = \boxed{(62)^8}$$

$$26 + 26 + 10 = 62$$