

Welcome! Reflect and Turn in!

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: <u>5-21</u> Topic: <u>3E.1 & 3E.2 Venn Diagrams</u>	0 1 2	
Tuesday Date: <u>5-22</u> Topic: <u>Venn Diagrams Day 2</u>	0 1 2	
Wednesday Date: <u>5-23</u> Topic: <u>Venn Diagrams Day 3</u>	0 1 2	
Thursday Date: <u>5-24</u> Topic: <u>Venn Diagrams Day 4 (Snap/Insta/FB)</u>	0 1 2	
Friday Date: <u>5-25</u> Topic: <u>(Nothing due today!)</u>	0 1 2	

MYP Math 9 - End of Year! :)

Fri. 5/25 - Probability Topics

Mon. 5/28 - NO SCHOOL

Tues. 5/29 - Probability Topics

Wed. 5/30 - Unit 8 Test

Thurs. 5/31 - Final Review

Fri. 6/1 - Final Review Mr. Ehlke

Mon. 6/4 - Final Review

Tues. 6/5 - FINAL EXAMS 2,3,4 (1st hour study Hall)

Wed. 6/6 - FINAL EXAMS 1,5,6,7

Warm-up: No repeats

How many numbers greater than 100 can be created using the digits 1,2,3,4?

3 digits

$$\underline{4} \times \underline{3} \times \underline{2}$$

24 #'s > 100

4 digit

$$\underline{4} \underline{3} \underline{2} \underline{1}$$

24# (# digits)
> 100

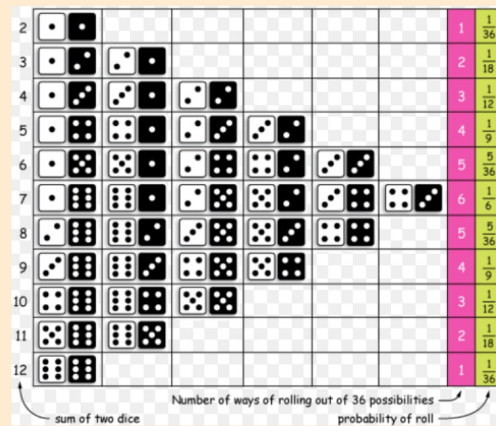
Class Plan

- 1) Warm-up
- 2) Go over Quiz 8.1
- 3) Unit 8 Probability Review

Unit 8: Probability

Do:

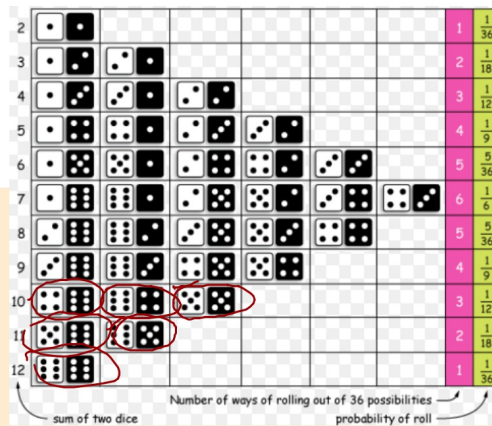
1. Look over Quiz 8.1
2. Review Handout (or any past handouts!)



1) Experimental/Theoretical Probability

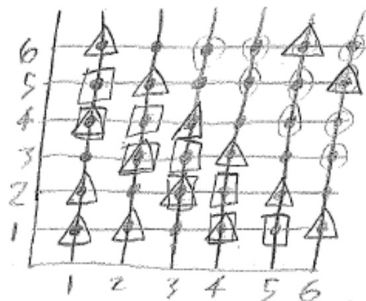
Two dice are rolled simultaneously.

- a** Illustrate the possible outcomes on a 2-dimensional grid.
- b** Determine the probability of getting:
 - i** a double 5
 - ii** at least one 4
 - iii** a sum greater than 9
 - iv** a sum of 5 or 6.
- c** If the dice were rolled 900 times, on how many occasions would you expect the sum of the rolls to be prime?



SOLUTION

5. a.



36 outcomes

b. i. $\frac{1}{36}$ ii. $\frac{11}{36}$ iii. $\frac{10}{36} = \frac{5}{18}$ iv. $\frac{9}{36} = \frac{1}{4}$

c. $\Delta = \text{Prime Sums} \Rightarrow 15$

$$P(\text{Prime Sum}) = \frac{15}{36} = \frac{5}{12} \quad \left(\frac{5}{12}\right) \cdot 900 = 375$$

$$\frac{5}{12} = \frac{x}{900} \Rightarrow \frac{12x}{12} = \frac{4500}{12} \Rightarrow x = 375 \quad \boxed{375 \text{ rolls}}$$

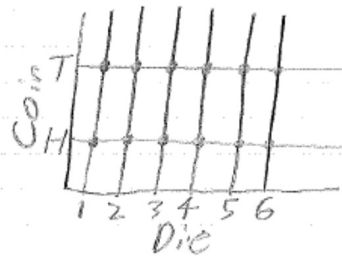
2) Tree Diagrams/Counting Outcomes (Feel free to list or a tree for part a)

A coin is tossed and a die is rolled simultaneously.

- a** Illustrate the sample space on a grid.
- b** Find the probability of getting:
 - i** a head and an even number
 - ii** a head and a non-3
 - iii** a 5 or a 6
 - iv** a head or an even number.
- c** If the experiment is performed *twice*, find the probability of getting two heads and two numbers whose sum is 7.

SOLUTION

4. a.



$\Rightarrow H_1, H_2, H_3, H_4, H_5, H_6$
 $\Rightarrow T_1, T_2, T_3, T_4, T_5, T_6$

b. i. $P(\text{Head and Even}) = \frac{3}{12} = \frac{1}{4}$

H_2, H_4, H_6

ii. $P(\text{Head and non-3}) = \frac{5}{12}$

H_1, H_2, H_4, H_5, H_6

iii. $P(5 \text{ or } 6) = \frac{4}{12} = \frac{1}{3}$

H_5, T_5, H_6, T_6

iv. $P(\text{H or Even}) = \frac{9}{12} = \frac{3}{4}$

$H_1, H_2, H_3, H_4, H_5, H_6,$
 T_2, T_4, T_6

SOLUTION

Cont. c. $P(2H \text{ and a sum of } 7)$

<u>Roll 1</u>	<u>Roll 2</u>
H1	H6
H2	H5
H3	H4
H4	H3
H5	H2
H6	H1

6 outcomes

Total Outcomes

~~12 outcomes~~
12 outcomes for
first experiment

12 for second

$\Rightarrow 12 \cdot 12 = 144$ outcomes.

$$P(2H \text{ and a sum of } 7) = \frac{6}{144} = \frac{3}{72} = \boxed{\frac{1}{24}}$$

3) Tree Diagrams

A hat contains 12 tickets with the numbers 1 to 12 printed on them. If two tickets are drawn from the hat without replacement, find the probability that they are both prime numbers.

SOLUTION

2. $P = \text{Prime numbers}$; $P = \{2, 3, 5, 7, 11\}$
 $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$ $\leftarrow 12 \text{ #'s}$
 $\leftarrow 5 \text{ #'s}$

$$\begin{array}{l} \frac{5}{12} \text{ } P \\ \swarrow \quad \searrow \\ \frac{4}{11} \text{ } P \quad \frac{7}{11} \text{ } P' \\ \swarrow \quad \searrow \\ \frac{5}{11} \text{ } P \quad \frac{6}{11} \text{ } P' \end{array}$$

$P = \frac{20}{132} = \frac{5}{33}$
 $P' = \frac{35}{132}$
 $P' = \frac{42}{132} = \frac{7}{11}$

$P(\text{Prime and Prime}) =$

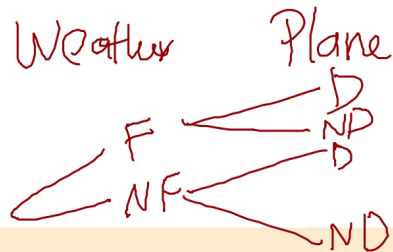
$$\frac{5}{12} \cdot \frac{4}{11} = \frac{20}{132} = \frac{5}{33}$$

$= 15.15\%$

4) Tree Diagrams

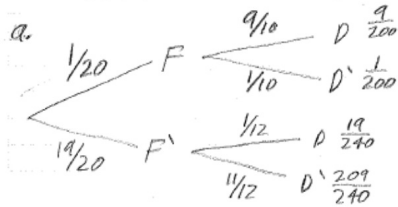
The probability of a delayed flight on a foggy day is $\frac{9}{10}$. When it is not foggy the probability of a delayed flight is $\frac{1}{12}$. The probability of a foggy day is $\frac{1}{20}$.

- a Construct a tree diagram to show this information.
- b Hence, find the probability of:
 - i a foggy day and a delayed flight
 - ii a delayed flight
 - iii a flight which is not delayed.
- c Comment on your answers to b ii and iii.



SOLUTION

1. F = Foggy, D = Delayed Flight



$$\frac{9}{200} + \frac{1}{200} + \frac{19}{240} + \frac{209}{240} = \frac{10}{200} + \frac{228}{240} = \frac{1}{20} + \frac{19}{20} = \frac{20}{20} = 1 \quad \checkmark$$

b. i. $P(F \cap D) = \frac{1}{20} \cdot \frac{9}{10} = \boxed{\frac{9}{200}} = 4.5\%$

ii. $P(D) = \frac{9}{200} + \frac{19}{240} = \frac{9}{200} \left(\frac{6}{6}\right) + \frac{19}{240} \left(\frac{5}{5}\right) = \frac{54}{1200} + \frac{95}{1200} = \boxed{\frac{149}{1200}}$
 $\approx 12.42\%$

iii. $P(D') = \frac{1}{200} + \frac{209}{240} = \frac{1}{200} \left(\frac{6}{6}\right) + \frac{209}{240} \left(\frac{5}{5}\right) = \frac{6}{1200} + \frac{1045}{1200} = \boxed{\frac{1051}{1200}}$
 $\approx 87.58\%$

c. The answers in ii and iii add up to 1 because they are complements of one another.

$$\frac{149}{1200} + \frac{1051}{1200} = \frac{1200}{1200} = 1$$

Find the number of possible outcomes in the sample space.

A jewelry store sells gold and platinum rings. Each ring is fitted with a ruby, sapphire, emerald, or diamond gemstone.

A spinner can land on either red, blue, green, yellow, or purple. You flip a coin and then spin the spinner.

Find the number of possible outcomes in the sample space.

A padlock's combination is four digits long.

A basketball player attempts seven free throws. Each attempt results in a score or a miss.

SOLUTION

3. a. G=Gold, P=Platinum, R=Ruby, S=Sapphire, E=Emerald,
D=Diamond.

GR, GS, GE, GD
PR, PS, PE, PD 8 Outcomes

b) H=Heads, T=Tail, R=Red, B=Blue, G=Green, Y=Yellow, P=Purple

$\frac{2}{\text{Coin}} \cdot \frac{5}{\text{color}} = \boxed{10 \text{ outcomes}}$ HR, HB, HG, HY, HP
TR, TB, TG, TY, TP

c) $\frac{10}{\text{Digit 1}} \cdot \frac{10}{\text{Digit 2}} \cdot \frac{10}{\text{Digit 3}} \cdot \frac{10}{\text{Digit 4}} = 10,000$ 10 digit choices

10,000 Outcomes

d) 2 options on each free throw.

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^7 = \boxed{128 \text{ outcomes}}$

6) Find the number of distinguishable permutations of the letters in the word.

a) HI

b) JET

c) IOWA

d) MAGNETIC

e) PUPPY

f) LETTER

g) ALABAMA

h) CONNECTICUT

f) What is the difference between a-d and e-h?

SOLUTION

of ARRANGEMENTS/PERMUTATIONS

b) a) HI $\frac{2!}{2!} = 2$ HI or IH
b) JET $3! = 3 \cdot 2 \cdot 1 = 6$ JET EJT TEJ
JTE ETS TJE
c) IOWA $4! = 4 \cdot 3 \cdot 2 \cdot 1 = 24$
d) MAGNETIC $8! = 40,320$

e) PUPPY $\frac{5!}{3!} = \frac{5 \cdot 4 \cdot 3!}{3!} = 20$
UNIQUE ARRANGEMENTS

f) LETTER $\frac{6!}{2!2!} = \frac{6 \cdot 5 \cdot 4 \cdot 3 \cdot 2!}{2 \cdot 2}$
 $= \frac{30 \cdot 6}{2 \cdot 2} = 180$
UNIQUE ARRANGEMENTS

g) ALABAMA $\frac{7!}{4!} = \frac{7 \cdot 6 \cdot 5 \cdot 4!}{4!} = 210$

h) CONNECTICUT $\frac{11!}{3!2!2!} = \frac{11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4!}{3! \cdot 2! \cdot 2!}$
 $= 1663200$

(e-h) have repeated letters

Exercises...

Finish Worksheet
-Bring questions
on Tuesday!

Enjoy the nice weather!

