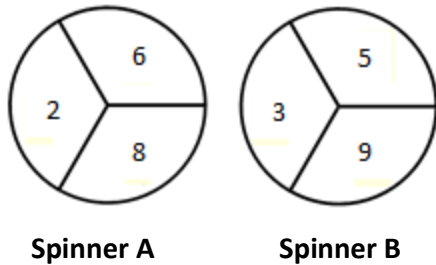


Secondary II Mathematics: Unit 4: Practice Assessment Key

Name: _____ Class Period: _____

- 1) Each player spins a spinner once. Player A uses spinner A, and Player B uses spinner B. The one with the larger number wins. Is this a fair game? Explain.

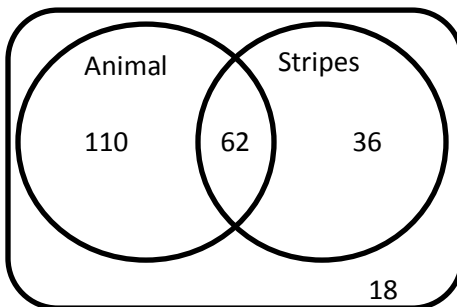


$$P(\text{Player A Wins}) = 4/9$$

$$P(\text{Player B Wins}) = 5/9$$

Not fair.

- 2) What is $P(\text{Animal}|\text{Stripes})$?



$$\frac{31}{49} \approx 0.633$$

- 3) You have a standard deck of cards. What is $P(\text{Queen or Black})$?

$$\frac{4}{52} + \frac{26}{52} - \frac{2}{52} = \frac{28}{52} = \frac{7}{13}$$

- 4) Xavier needs to paint “LADIES” by the women’s restroom and “GENTLEMEN” by the men’s restroom. He does not want to buy extra stencils. What is the set of stencils that he needs?

$\{A, D, E, G, I, L, M, N, S, T\}$

- 5) Consider the set $T = \{1, 3, 9, 27, 81, 243\}$.

Given the subset $V = \{1, 9, 81\}$, what is V^c ?

$\{3, 27, 243\}$

- 6) Hermione is selecting a number to put on her race car. She wants the number to be a natural number less than 23 that is not divisible by 2 or 5.

Write the set that represents the sample space for the numbers from which Hermione will choose.

$\{1, 3, 7, 9, 11, 13, 17, 19, 21\}$

7) For a particular sample of cheese: $P(\text{White}) = 0.12$ and $P(\text{Holes}) = 0.75$

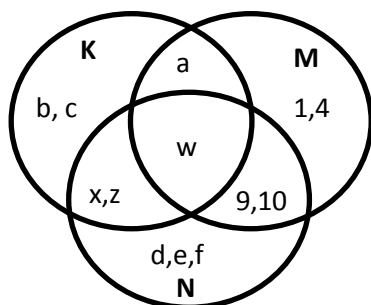
It is known that the joint probability of a cheese being white and having holes is 0.09.

Prove that cheese color and cheese having holes are independent.

$$0.12 \cdot 0.75 = 0.09$$

\therefore Cheese color and cheese having holes are independent events.

8) Given the Venn Diagram, what is the set $K \cup N$?



$\{a, b, c, d, e, f, w, x, z, 9, 10\}$

9) Define the union of events.

All outcomes from each event.

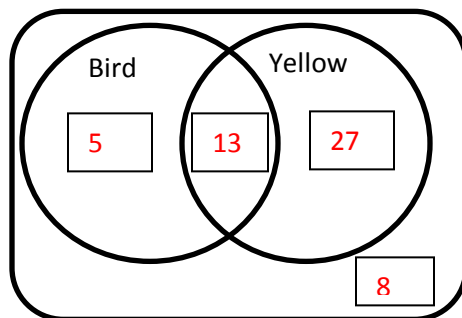
10) Given:

$$P(\text{Yellow} | \text{Bird}) = \frac{13}{18}$$

$$P(\text{Yellow} \cap \text{Bird}) = \frac{13}{53}$$

$$P(\text{Yellow}) = \frac{40}{53}$$

Fill in the values in the Venn Diagram.



11) Define the intersection of events.

Only those outcomes that are in both events.

12) Jameson polls the rodeo club at his school to see which event they like.

30 students like calf-roping only. 55 students like bull-riding only. 90 students like calf-roping and bull-riding.

Find $P(\text{like calf} - \text{roping} | \text{like bull} - \text{riding})$ for the rodeo club.

$$\frac{90}{145} = \frac{18}{29}$$

13) Given: $G = \{7, 8, 9, j, k, l\}$, $H = \{8, 10, 11, l, m, n\}$, what is:

- the union of G and H ($G \cup H$) $\{j, k, l, m, n, 7, 8, 9, 10, 11\}$
- the intersection of G and H ($G \cap H$) $\{8, l\}$

14) How many distinguishable permutations are in the word COCONUT?

1260

15) $A = \{Jack\}$ and $B = \{Red\}$. What is $A \cap B$?

$$\frac{2}{52} = \frac{1}{26}$$

16) You roll two standard dice and sum the two values. What is the probability that the values of the two dice sum to 8?

$$\frac{5}{36}$$

17) Use the following probabilities to fill out the two-way frequency table.

$$P(\text{not fruit} | \text{not orange}) = \frac{17}{87} \quad P(\text{fruit} \cap \text{orange}) = \frac{71}{163} \quad P(\text{not orange}) = \frac{87}{163}$$

	orange	not orange	Totals
fruit	71	70	141
not fruit	5	17	22
Totals	76	87	163

18) Give an example of a compound event that consists of two or more independent events?

Answers will vary.

19) You randomly choose two marbles, replacing the first marble before drawing again, from a bag containing 10 black, 8 red, 2 white, and 6 blue marbles.

Find the probability that a blue marble is not selected, and then a white marble is selected.

$$\frac{40}{676} = \frac{10}{169}$$

- 20) The table below shows the number of students at Flentonville High School who ate breakfast before taking the ACT exam and the number of students whose scores met the minimum requirement for college entrance.

	Breakfast	No Breakfast	Totals
Met min. requirement	180	146	326
Did not meet min. requirement	144	88	232
	324	234	558

Leonard eats breakfast before taking the ACT. Beula does eat breakfast first. According to the data in the table, who is more likely to pass the test?

Justify your response with calculations and explain your reasoning.

It is more probable that Beula will pass the exam given she did not eat breakfast class.

$$P(\text{met requirement}|\text{breakfast}) \approx 0.555$$

$$P(\text{met requirement}|\text{no breakfast}) \approx 0.624$$

$$0.555 < 0.624$$

- 21) There are 18 blue ribbons and 4 red ribbons inside a sewing box. If 4 ribbons are chosen at random, what is the probability that they are all red?

$$\frac{{}_4C_4}{{}_{22}C_4} = \frac{1}{7315}$$

- 22) Use the frequency table to find $P(\text{Red}|\text{Male})$.

$$\frac{.15}{.44} = 0.341$$

	Red	Blue	Yellow	Totals
Female	0.25	0.16	0.15	0.56
Male	0.15	0.19	0.10	0.44
Totals	0.40	0.35	0.25	1.00

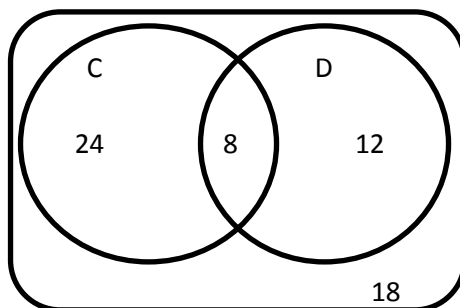
- 23) An electronics company conducts survey. 47% of those surveyed are women and 53% are men. 45% of the women surveyed like tablets, and 36% of the men like tablets. What is the probability that a person selected at random is a woman who likes tablets?

$$P(\text{woman}) \cdot P(\text{likes tablet}|\text{woman})$$

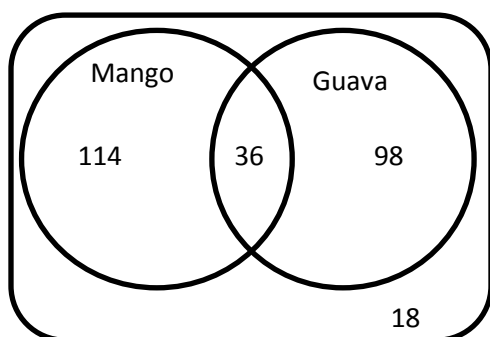
$$= 0.47 \cdot 0.45 \approx 0.212$$

- 24) Given the following Venn diagram, what is $P(C \cap D)$?

$$\frac{8}{62} = \frac{4}{31}$$



25) Use the Venn Diagram to fill out the two-way frequency table.



	Guava	No Guava	Totals
Mango	36	114	150
No Mango	98	18	116
Totals	134	132	266

26) Sherman tosses a coin and then rolls a die. Find $P(\text{heads and 1 or even})$.

$$\frac{1}{2} \left(\frac{1}{6} + \frac{3}{6} \right) = \frac{1}{3}$$

27) You randomly choose two marbles, you do not replace the first marble before drawing again, from a bag containing 6 black, 10 red, 6 white, and 8 blue marbles.

Find the probability that a white marble is selected, and then a marble that is not black is selected.

$$\frac{6}{30} \cdot \frac{23}{29} = \frac{23}{145}$$

28) An ice cream shop has a special for a cup of rocky road or mint flavored ice cream with a single topping of sprinkles or gummy bears. The frequency table includes the data for customer purchases.

	Rocky Road	Mint	Totals
Sprinkles	30	22	52
Gummy Bears	19	29	48
Totals	49	51	100

Use data about the strawberry topping and chocolate flavored yogurt to show that yogurt flavor is not independent of the topping.

There are multiple correct responses to this prompt. Students may use conditional probability or the multiplication rule.

Example using conditional probability.

$$\frac{P(S \cap M)}{P(M)} \neq P(S) \Rightarrow \frac{22}{51} \neq \frac{52}{100}$$

Example using the multiplication rule.

$$P(S) \cdot P(M) \neq P(S \cap M) \Rightarrow \frac{52}{100} \cdot \frac{51}{100} \neq \frac{22}{100}$$

29) A state is going to choose 3 digits from 0-9 for a new phone area code. Each digit can only be used once. Is the area code a permutation or a combination? What is the probability that the area code is 371?

Permutation, $\frac{1}{720}$

30) 9/25 people like gerbils. 15/25 people like hamsters. 7/25 people like gerbils and hamsters. What is $P(\text{gerbils}|\text{hamsters})$?

$\frac{7}{15}$