

1. Jared plays a game where the players take turns spinning a wheel with 3 spaces. Each have a different prize value. The probability of landing on \$200 is  $\frac{3}{7}$ , probability of landing on \$500 is  $\frac{2}{7}$ , and the probability of landing on \$1,000 is  $\frac{2}{7}$ . What is Jared's expected value (in monetary earnings) if he plays the game?

$$E(V) = \frac{2}{7}(500) + \frac{3}{7}(200) + \frac{2}{7}(1000) = \boxed{\$514.29}$$

2. Jonathan draws a ticket from a box to select the door-prize winners at a party. The tickets are numbered from 1 to 25. What is the expected value that the tickets drawn will have numbers less than 5 if he draws tickets 40 tickets?

$$E(V) = \frac{4}{25} \cdot 40 = \boxed{6.4 \text{ tickets}}$$

1, 2, 3, 4

3. Niki has 9 new paperback books. Two of the paperbacks are mysteries, three are science fiction, and the rest are romances. If Niki were to randomly select two books from this set without replacing them, what is the probability that the first book selected is science fiction and the second book selected is a romance?

$$\text{S.F.} = \frac{3}{9}$$

$$\frac{3}{9} \cdot \frac{4}{8} = \boxed{\frac{1}{6}}$$

4. Jamal has a game with 2 groups of tiles. The first group of 26 tiles is labeled with all the letters of the alphabet. The second group of 10 tiles is numbered 0 through 9. If Jamal draws 1 letter tile and 1 number tile at random, what is the probability that he will draw a letter in his name and an odd number?

$$\frac{J}{a} = \frac{4}{26} \cdot \frac{5}{10} = \boxed{\frac{1}{13}}$$

1 3 5 7 9  $\Rightarrow$  5 odd

5. Which of the following is an **outcome**?

- A. Rolling a pair of dice
- B. Choosing 2 marbles from a jar
- C. Landing on red
- D. None of the above

6. A pizza parlor surveyed 100 customers to determine their favorite pizza topping or combination of toppings. The results are shown below. Find the following probabilities:



$$P(\text{pepperoni}) = \frac{52}{100} = \frac{13}{25}$$

$$P(\text{Sausage and Mushrooms}) = \frac{8}{100} = \frac{2}{25}$$

$$P(\text{Pepperoni or Sausage}) = \frac{82}{100} = \frac{41}{50}$$

$$P(\text{Mushrooms} | \text{Pepperoni}) = \frac{12}{52} = \frac{3}{13}$$

7. You go to a restaurant where you are able to create your own salad. The table below represents all the possible choices to create your ideal salad.

Lettuce	Toppings	Dressing
Ice Berg .5	Cheese .25	Ranch .33
Romaine .5	Tomato .25	Italian .33
	Ham .25	Thousand Island .33
	Cucumber .25	

- a. How many salads can be made from these options?

$$2 \cdot 4 \cdot 3 = 24 \text{ different salads}$$

- b. What is the probability of creating a salad with ice berg lettuce with Ranch dressing and one topping?

$$0.5 \times 0.33 \cdot 1 = 16.5\%$$

- c. What is the probability that you create a salad with romaine lettuce, tomatoes, and any dressing? Justify your answer.

$$0.5 \times 0.25 \cdot 1 = 12.5\%$$

- d. What is the probability that you create a salad with ice berg lettuce, Italian dressing, and either cheese or ham as a topping? Justify your answer.

$$0.5 \times 0.33 \times (0.25 + 0.25) = 8.25\%$$



8. You are registering for classes, you have the following choices:
- |  |  |
|--|--|
| Salazar- 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> | Morning classes will be 1 <sup>st</sup> -4 <sup>th</sup> |
| James- 3 <sup>rd</sup> , 4 <sup>th</sup> , 5 <sup>th</sup> , 6 <sup>th</sup> , 8 <sup>th</sup>   | Afternoon classes 5 <sup>th</sup> -8 <sup>th</sup>       |
| Fowler- 1 <sup>st</sup> , 2 <sup>nd</sup> , 6 <sup>th</sup> , 7 <sup>th</sup>                    |  |
| Sturdivant- 3 <sup>rd</sup> , 4 <sup>th</sup> , 7 <sup>th</sup> , 8 <sup>th</sup>                |  |
| Josey- 1 <sup>st</sup> , 2 <sup>nd</sup> , 6 <sup>th</sup> , 8 <sup>th</sup>                     |  |

	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>
Salazar	X	X	X			X	X	
James			X	X	X	X		X
Fowler	X	X				X	X	
Sturdivant			X	X			X	X
Josey	X	X				X		X
Jackson	X		X		X	X		

a. What is the probability of getting a morning class?  $\frac{11}{22} = \frac{1}{2}$

b. Before deciding on a morning or afternoon class, Lisa remembered she wants to take her  class during 2<sup>nd</sup> period. What is the probability she will be scheduled a  class during this time?  $\frac{3}{22}$

c. All of the morning science classes are filled & Lisa has a decision to take either Mrs. James or Mrs. Josey in the afternoon, what is the probability of Lisa taking a  class in the afternoon?  $\frac{5}{11}$

d. Lisa is deciding on whether she should take  a class in the morning or afternoon, when her school counselor informs her all of Mrs. Fowler's classes are filled. The school adds another teacher Mrs. Jackson. She will teach (1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup>, and 6<sup>th</sup>). What is now the probability of getting Mrs. Jackson for  class in the morning?  $P(\text{Jackson, morning}) = \frac{2}{22} = \frac{1}{11}$

9. Phoenix goes to the North Georgia State fair and tries to play his luck at a game. He must roll a die and then spin a spinner with the possible outcomes of red, blue or purple.

a. Draw an area model to fit this scenario:

	1	2	3	4	5	6
R	r1	r2	r3	r4	r5	r6
B	B1	B2	B3	B4	B5	B6
P	P1	P2	P3	P4	P5	P6

18 outcomes

b. P(rolling 5)  $\frac{3}{18} = \frac{1}{6}$

c. P(spinning purple or rolling an even number)  $\frac{6}{18} + \frac{6}{18}$  (evens that aren't purple) =  $\frac{2}{3}$

d. P(rolling a prime number and spinning red)  $\frac{3}{18} = \frac{1}{6}$

10. A college surveyed 1125 freshman students about which meals they ate in the school cafeteria. The findings were as follows:

25 ate only breakfast, 15 ate only lunch, 50 ate only dinner, 60 ate only lunch and breakfast, 225 ate only lunch and dinner, 500 ate only dinner and breakfast, 240 ate all three meals in the cafeteria.

a. Fill in the Venn Diagram to fit the scenario: ✓

b. P(Ate only breakfast)

$$\frac{25}{1125} = \frac{1}{45}$$

c. P(Ate breakfast & lunch but not dinner)

$$\frac{60}{1125} = \frac{4}{75}$$

d. P(Ate at least 2 meals)

$$\frac{1025}{1125} = \frac{41}{45}$$

e. P(Ate only 1 meal)

$$\frac{90}{1125} = \frac{2}{25}$$

f. P(Ate exactly two meals)

$$\frac{785}{1125} = \frac{157}{225}$$

g. P(Did not eat in the cafeteria)

$$\frac{10}{1125} = \frac{2}{225}$$

