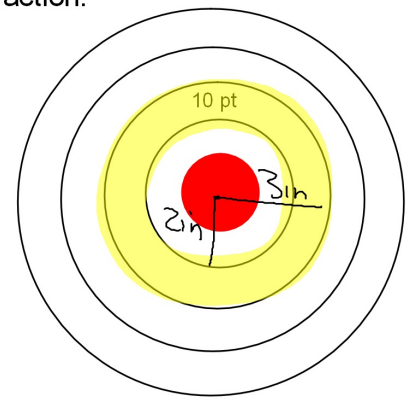
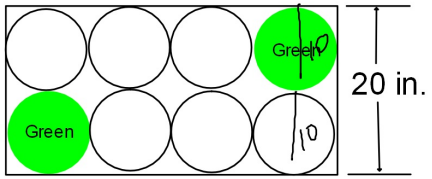
You throw a dart at the target below. Assuming the dart lands somewhere on the target, find the probability that it lands in the 10 point ring. The radius of the bulls-eye is 1 in. The width of each ring is 1 in. Give your answer as a fraction.



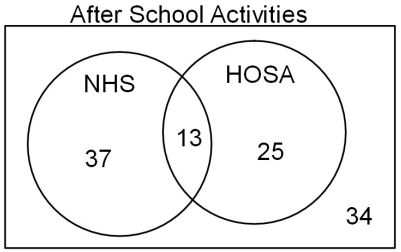
$$\frac{\text{Area of 10pt ring}}{\text{Area of Target}} = \frac{\pi(3)^2 - \pi(2)^2}{\pi(5)^2} = \frac{5\pi}{25\pi} = \frac{1}{5}$$

At a carnival you try a game where you have to throw an ball onto a board and have it land in one of the cans. If you land in the Green can you win a prize. What is the probability that you land in a Green can? Give your answer as a percent to the nearest tenth.



$$\frac{\text{2 circles}}{\text{Rectangle}} = \frac{2 \cdot \pi(5)^2}{(40)(20)} = 21.46\%$$

The Venn Diagram below shows after school activities that students belong to.



You will select a student at random, find each probability as a fraction.

a) P(NHS but not HOSA) $\frac{37}{109}$

b) P(Neither NHS nor HOSA) $\frac{34}{109}$

c) P(HOSA and NHS) $\frac{13}{109}$

d) P(Not NHS) $\frac{59}{109}$

Hwk #25

Sec 1-6

Due Friday

Pages 43-44

Problems 17-20, 24-27, 39

Sec 9-7: Probability of Multiple Events (Compound Events)

2 or more events happening at the same time or one right after the other.

In general, when you are finding the probability of two or more events:

AND → Multiply

OR → Add

Independent Events

When the outcome of one event does NOT affect the outcome of a second event

Dependent Events

When the outcome of one event DOES affect the outcome of a second event

Is each pair of event *Dependent* or *Independent* ?

1. Flipping a coin and rolling a die INDEP
2. You open the refrigerator and randomly grab a drink and finish it. You then reach in and randomly grab another drink and finish that one. DEP
3. Having your i-pod randomly play two songs, one after the other. INDEP if you can repeat / Dep if can't repeat
4. You take a can of spray paint from the shelf use it up then take another can and use it up. Dep

Probability of Two Independent Events A and B:

You flip a coin and roll a die.

Find the probability that you flip heads and roll a prime number.

$$P(A \text{ and } B) = P(A) \bullet P(B)$$

P(Heads and Prime #) = P(Heads) • P(Prime #)

$\frac{1}{2} \cdot \frac{3}{6} = \frac{3}{12} = \frac{1}{4}$

Probability of Two Dependent Events A and B:

On the shelf at a store are the following: 12 bags of BBQ chips, 8 bags of Sour Cream and Onion Chips, and 4 bags of Regular chips. You randomly grab a bag, eat it and randomly grab another bag.

Find the probability that the first bag is Regular and the second bag is BBQ. Give answer as a fraction.

$$P(A \text{ and } B) = P(A) \bullet P(B \text{ after } A)$$

P(Regular and BBQ) = $\frac{4}{24} \cdot \frac{12}{23} = \frac{48}{552}$

In your refrigerator there are 24 Cokes and 3 cans of Pepsi. You randomly grab a drink and finish it. You then reach in and randomly grab another drink and finish that one.

Find the probability that you grab a Coke then grab a Pepsi.

P(Coke and Pepsi) = $\frac{24}{27} \cdot \frac{3}{26} = \frac{72}{702}$

Find the probability you grab a Coke then another Coke.

P(Coke and Coke) = $\frac{24}{27} \cdot \frac{23}{26} = \frac{552}{702}$

In your drawer are 3 blue shirts, 4 white shirts, 2 red shirts, and 1 black shirt. You will pull out more than one sock.

Find each probability as a fraction.

(a) P(blue and blue) without replacement $\frac{3}{10} \cdot \frac{2}{9} = \frac{6}{90}$

(b) P(red then black) without replacement $\frac{2}{10} \cdot \frac{1}{9} = \frac{2}{90}$

(c) P(white then blue then white) without replacement. $\frac{4}{10} \cdot \frac{3}{9} \cdot \frac{3}{8} = \frac{36}{720}$

(d) P(red then red) with replacement $\frac{2}{10} \cdot \frac{2}{10} = \frac{4}{100}$

(e) P(black then white then red) with replacement $\frac{1}{10} \cdot \frac{4}{10} \cdot \frac{2}{10} = \frac{8}{1000}$

(f) P(blue then blue then blue) with replacement $\left(\frac{3}{10}\right)^3 = \frac{27}{1000}$

Mutually Exclusive Events:

When two events CAN'T happen at the same time.

Not Mutually Exclusive means:

The two events CAN happen at the same time.

Are these events mutually exclusive? NO

- Being 5'3" tall
- Dunking a basketball

Mugsy Bogues was an NBA player at 5'3" tall and he could dunk the ball.

can happen at the same time

Is each pair of events mutually exclusive?

1. Getting an even number or a 5 when you roll a die. Yes
   can't happen at the same time
2. Getting a multiple of 3 or an even number when you roll a die.
   can happen at the same time NO
3. Getting a prime number or an even number when rolling a die. NO
   can happen at the same time
4. Rolling a 2 or a 3 on a die. Yes
   can't happen at the same time

Is each pair of events mutually exclusive?

a) Going to the movies at 8:00pm and playing in your softball game at 8:00 pm. Yes can't happen at the same time

b) Studying at 8:00pm and listening to music at 8:00pm.

NO

can happen at the same time

Probability of Mutually Exclusive Events:

$$P(A \text{ or } B) = P(A) + P(B)$$

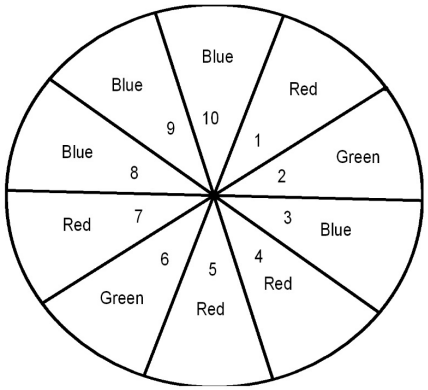
$$P(A \text{ and } B) = 0$$

You will spin the spinner once. Find the following probability as a fraction

Mutually Exclusive

P(Red or Blue) =

$\frac{4+4}{10} = \frac{8}{10}$



Probability of Events that are NOT Mutually Exclusive:

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

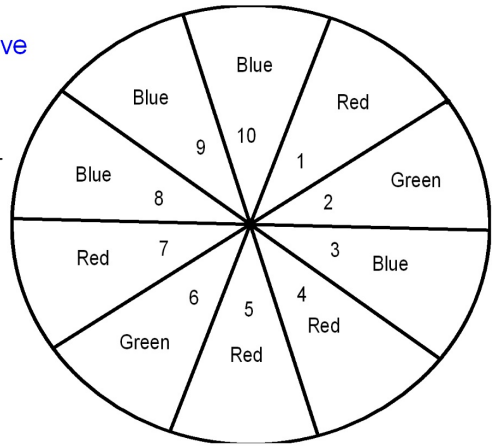
You will spin the spinner once. Find the following probability as a fraction

Not Mutually Exclusive

P(Even or Blue) =

$\frac{5}{10} + \frac{4}{10} - \frac{2}{10}$

$\frac{7}{10}$



A survey of people's favorite TV network was conducted. You will ask a random person their favorite network. Use the results below to find each probability as a fraction.

	ABC	NBC	Fox	CBS	total
male	12	8	15	5	40
female	9	14	10	7	40
total	21	22	25	12	80

P(Male and Fox) = $\frac{15}{80}$

Not Mutually Exclusive

P(ABC and NBC) = $\frac{0}{}$

Mutually Exclusive

P(Fox or CBS) = $\frac{37}{80}$

$25 + 12$

Mutually Exclusive

P(Female or ABC) = $\frac{52}{80}$

$40 + 21 - 9$

80

Not Mutually Exclusive