AP Stat　　　　　　　　Handout: Probability Models　　　Name ________________________
Ch 6.2: Probability Models

EQ:

➢ Terms to Know:

- Probability Model --- mathematical representation of a _________________________; defined by a _______________________, _________________________, and the _________________________ of these events occurring

- Sample Space --- collection of _______________________________________

❖ In Class p. 416 #29

a)　　　　　　　　　　　　　　　　　　b)

c)

RECALL:

- Tree Diagram ---

d)

- Event --- __________________________

- Probability of an Event ---

  P(E) =

Emperical　　　　　　　　　　vs　　　　　　　　　　Theoretical

Ex. Match the probabilities with each statement about an event. 0　0.01　1.0　0.3,　0.6　0.99　1.4

a) This event is unlikely but it will occur once in a while in a long sequence of trials.
b) This event will occur more often than not.
c) I don't know what this number represents, but it isn't probability.
d) This event is certain. It will occur on every trial of the random phenomenon.
e) This event is impossible. It will never occur.

- Multiplication Principal --- ____

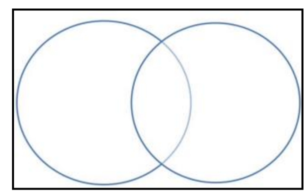
  If there are __________ways to make a first selection and ______ ways to make a second selection, there are _____________ ways to make the two selections.

Ex. How many outcomes can occur if you flip a coin and toss a die? State the sample space.

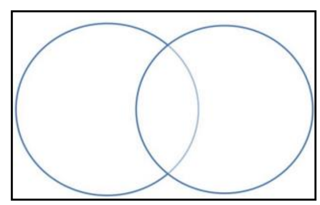
- Venn Diagram --- shows all ______________________ between a _____________________

______________________________ of sets.

❖ **Assignment p. 417 #33, 35, 36**

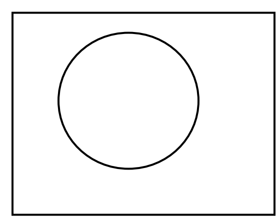


- Union of Two Sets --- all elements in _______________A _____ B



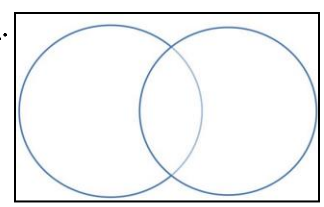
- Intersection of Two Sets --- elements found in

  ______________ A _________ B

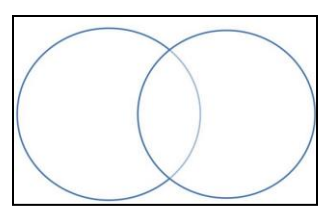


- Complement of a Set --- _________________________ in the universe

  that are _________________________________.



Example: Let U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10} Given : A = {2, 3, 5, 7, 8} B = {1, 2, 4, 6, 7 }



Find: $A \cup B$ =

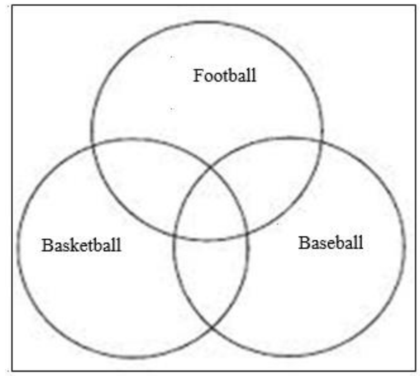
$A \cap B$ =

$(A \cup B)^c$ =

$A^c \cap B^c$ =

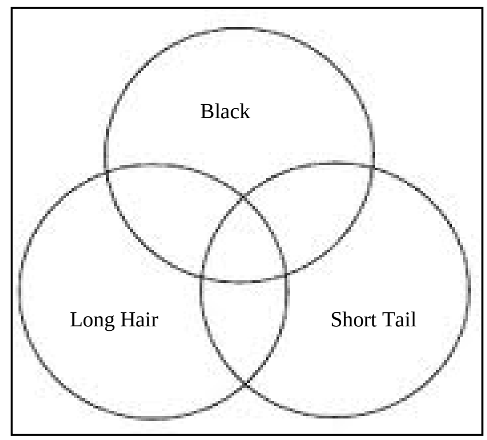
Ex. Create a Venn Diagram for the following.

Thirty males at OCHS were asked whether they played football, basketball, and/or baseball. Four responded that they played all three sports, 19 said they played football, 3 said they played football and basketball, 13 said they played baseball of which 4 said they played only baseball, no one responded that they played basketball and baseball, and 5 males said they do not play sports.



Ex. Create a Venn Diagram for the following.

Twenty-four dogs are in a kennel. Twelve of the dogs are black, six of the dogs have short tails, and fifteen of the dogs have long hair. There is only one dog that is black with a short tail and long hair. Two of the dogs are black with short tails and do not have long hair. Two of the dogs have short tails and long hair but are not black. If all of the dogs in the kennel have at least one of the mentioned characteristics, how many dogs are black with long hair but do not have short tails?



- Disjoint Events (aka ______________________________) --- 2 events

  which ___________ happen at the same time

  ___________________ = _________

______________________________ $\neq$ ______________________________

❖ **Formulas to Know for Calculating Probability:**

- Intersection of Two Independent Events ---
- Complement of an Event ---
- Probability of Two Disjoint Events ---
- Probability of Two Events that are NOT Disjoint ---

Ex. Use the following table to answer these questions.

		READ NOVEL		
		Yes	No	Total
READ TEXT	Yes	.30	.10	
	No	.12	.48	

a) Find the probability "read text" and "did not read novel".

❖ Are these events **INDEPENDENT**?

- RECALL: Two Independent Events are Independent ________________ = ___________________

Prove if these events are **INDEPENDENT** DOES _______ = _____________ ?

________ $\neq$ ________

Therefore the events are _______________________________

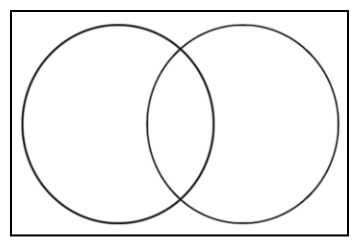
b) Find the probability "read novel" and "did not read text"?

Are these events **INDEPENDENT**? DOES _______ = _____________ ?

________ $\neq$ ________

Therefore the events are _______________________________

c) Make a Venn Diagram indicating the events A = "read text" or B = "read novel".



Ex. The following table represents the proportion of women aged 25 to 29 who have that marital status.

Marital Status	**Never Married**	**Married**	**Widowed**	**Divorce**
Probability	**.353**	**.574**	**.002**	**.071**

a) Show *two ways* to find P(not married).

b) Find P(never married or divorced).

➢ ***Assignment*** p. 423 – 425 #37 – 41, 44 p. 430 – 431 #45 - 52