GUIDED NOTES – STATS 3.5 VENN DIAGRAMS

LEARNING OBJECTIVES

In this section, you will:

- Create Venn diagrams
- Compute probabilities using Venn diagrams

CREATING VENN DIAGRAMS

When we create a Venn diagram, each circle or oval represents a(n) _____.

We then enclose all the circles and ovals inside a box that represents the _____.

When labeling outcomes, be careful to not double label outcomes inside intersections of events.

Try It: Read Example 3.27 in the text, then answer the following.

Roll a fair, six-sided die. Let A = a prime number of dots is rolled. Let B = an odd number of dots is rolled. Then A = {2, 3, 5} and B = {1, 3, 5}. Therefore, $A \cap B = \{3, 5\}$. $A \cup B = \{1, 2, 3, 5\}$. The sample space for rolling a fair die is S = {1, 2, 3, 4, 5, 6}. Draw a Venn diagram representing this situation.

Use your Venn diagram of the die rolls to compute the following probabilities.

$P(A \cup B) =$

$P(A' \cap B) =$

$P(A \mid B) =$

$P(B \mid A) =$

For fun, try and create a Venn diagram with the following criteria.

The sample space is the collection S = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}. Let event A = {1, 3, 5, 7, 9}, B = {2, 3, 5, 7}, and C = {3, 6, 9}. Let's say we are choosing a number at random, draw the Venn diagram for this situation. Can you find the probability of the event "the number that is chosen will be in the intersections of all events A, B, and C"?