Happy Tuesday! Welcome to class!

1. Put your homework on your desk
2. Write one word to describe each way to write a set
    a. Roster Form →
    b. Set Builder Notation →
    c. Interval Form →
3. I know last night's homework was hard, so I want you to take about 10 minutes to work on it/compare with a neighbor

Homework Check

16 Problem Worksheet

Announcements

- Test Corrections due tomorrow
- Unit 3 Test is on Friday

Unions and Intersections of Sets

10/9/2018

Today when we look at unions and intersections of sets, we are looking at two sets and comparing them

Think about times you have heard the words:

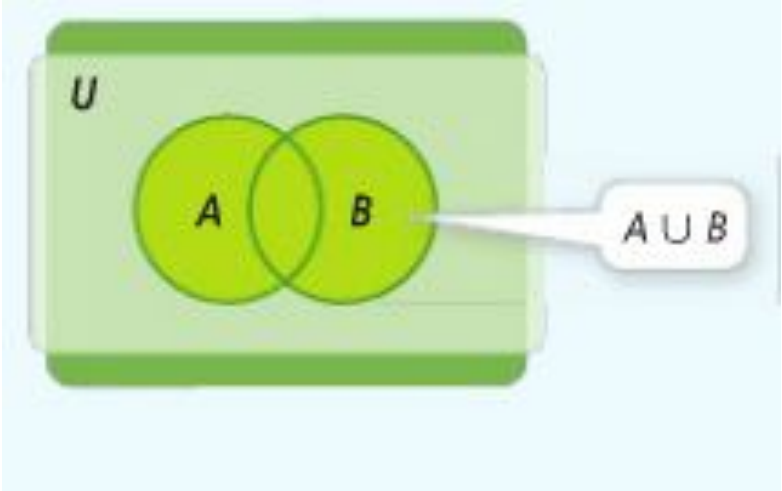
Union:

Intersection:

The textbook actually does a really great job talking about sets, so we will start by looking at what it says.

Union of Sets

A Union of sets is the set that contains ALL of the sets



Problem 1 Union of Sets

In your left pocket, you have a quarter, a paper clip, and a key. In your right pocket, you have a penny, a quarter, a pencil, and a marble. What is a set that represents the different items in your pockets?

Step 1 Write sets that represent the contents of each pocket.

Left pocket: $L = \{\text{quarter, paper clip, key}\}$

Right pocket: $R = \{\text{penny, quarter, pencil, marble}\}$

Step 2 Write the union of the sets, which represents the different items that are in your pockets.

$L \cup R = \{\text{quarter, paper clip, key, penny, pencil, marble}\}$

Got It? **1. a.** Write sets P and Q below in roster form. What is $P \cup Q$?

$P = \{x \mid x \text{ is a whole number less than } 5\}$

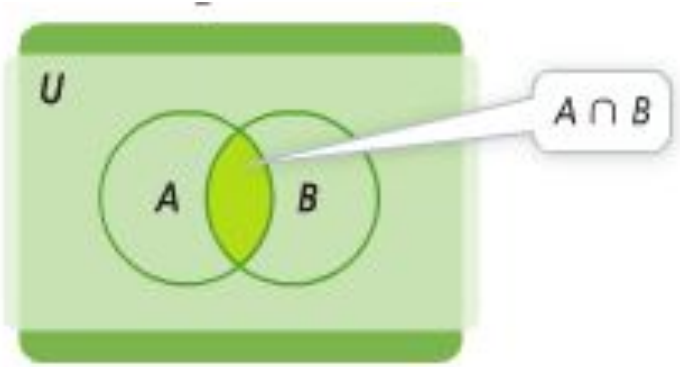
$Q = \{y \mid y \text{ is an even natural number less than } 5\}$

b. Reasoning What is true about the union of two distinct sets if one set is a subset of the other?

The Union of Sets could be compared to an “or” statement. What makes them similar?

Intersection of Sets

The intersection of sets is the set of elements that are common in all of the sets

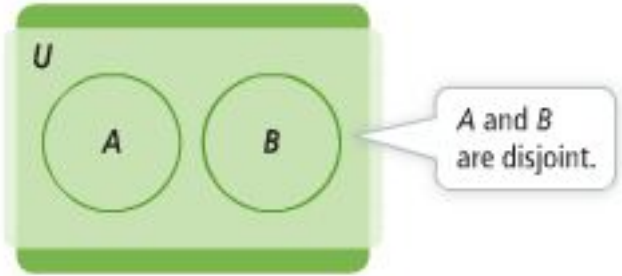


The Intersection of Sets could be compared to an “and” statement. What makes them similar?

Disjoint Sets

Some sets have nothing in common. This is called Disjoint.

The intersection of two disjoint sets is an empty set.



Problem 2 Intersection of Sets

Set $X = \{x \mid x \text{ is a natural number less than } 19\}$, set $Y = \{y \mid y \text{ is an odd integer}\}$, and set $Z = \{z \mid z \text{ is a multiple of } 6\}$.

A What is $X \cap Z$?

List the elements that are both natural numbers less than 19 and multiples of 6: $X \cap Z = \{6, 12, 18\}$.

B What is $Y \cap Z$?

List the elements that are both odd integers and multiples of 6. There are no multiples of 6 that are also odd, so Y and Z are disjoint sets. They have no elements in common. $Y \cap Z = \emptyset$, the empty set.

Got It? **2.** Let $A = \{2, 4, 6, 8\}$, $B = \{0, 2, 5, 7, 8\}$, and $C = \{n \mid n \text{ is an odd whole number}\}$.

a. What is $A \cap B$? **b.** What is $A \cap C$? **c.** What is $C \cap B$?

Practice for You!

Let $X = \{2, 4, 6, 8, 10\}$, $Y = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, and $Z = \{1, 3, 5, 7, 9\}$. Find each union or intersection.

1. $X \cup Y$ **2.** $X \cap Y$ **3.** $X \cap Z$ **4.** $Y \cup Z$

5. In a survey of 80 people who use their cell phones to take pictures and play games, 49 take pictures and 35 take pictures and play games. How many people only use their cell phones to play games?

Find each union or intersection. Let $W = \{5, 6, 7, 8\}$, $X = \{3, 6, 9\}$, $Y = \{2, 3, 7, 8\}$, and $Z = \{x \mid x \text{ is an even whole number less than } 10\}$.

33. $W \cup Y \cup Z$

34. $X \cap Y \cap Z$

35. $W \cap X \cap Z$

Tonight's Homework - POSTPONED

1. Page 218 #10-14, 22-24, 36
2. Optional → on page 222 of your textbook, you can find the Chapter 3 Review. This could be a good place to go if you want to start reviewing what we have learned!