

**Algebra 1-3: Operations with Sets- Union & Intersection**

Warm-Up

Graph on a number line.

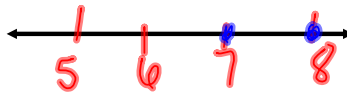
1.  $x > 6$ , where  $x$  is a real number.



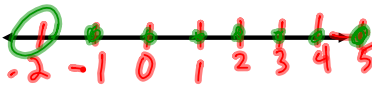
2.  $x > 6$ , where  $x$  is a whole number.



3.  $x > 6$ , where  $x$  is an integer.



4.  $-2 < x \leq 5$ , where  $x$  is an integer.



5.  $-2 < x \leq 5$ , where  $x$  is a real number.



Vocabulary	Definition	Example
Intersection of sets AND $\cap$	- things in common in both sets	$A = (-1, 0, 2, 3)$ $B = (-3, -1, 3, 4)$ $A \cap B = (-1, 3)$
Union of Sets OR $\cup$	- lists all numbers in sets	$A \cup B = (-3, -1, 0, 2, 3, 4)$
Empty Set (null) $\emptyset$	A set with nothing	
Venn Diagram		

Example Problems

1. A: {0, 1, 9, 11, 12, 19}

Find  $A \cap B$ . = (1, 9, 19)

B: {-3, 1, 2, 4, 9, 19, 25}

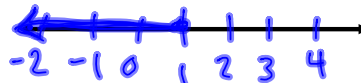
Find  $A \cup B$ . = (-3, 0, 1, 19, 12, 2, 25, 4, 11, 9)

Make a Venn Diagram to show the intersection of sets A & B.



less than or equal to

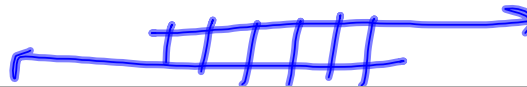
2. a) Graph the set of real numbers  $m \leq 1$ .



b) Graph the set of real numbers  $m > -2$ .



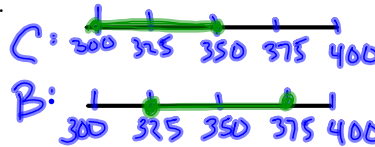
c) Graph the set of all numbers  $m$  such that  $m \leq 1$  and  $m > -2$ .



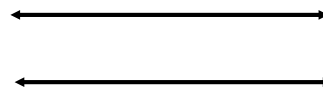
3. You want to bake a cake and brownies at the same time in the oven. The cake calls for oven temperatures that range from 300 to 350 degrees. The brownies call for oven temperatures ranging from 325 to 375 degrees.

a. Describe each interval with an inequality.

$300 \leq C \leq 350$   
 $325 \leq B \leq 375$



b. Graph each interval in part a.



c. Describe their intersection with an inequality.

$325 \leq T \leq 350$   
 ↓  
 temp

d. What temperatures are right for both a cake and brownies?

$325^\circ - 350^\circ$

4. L: {Set of even whole numbers}  
(2, 4, 6, 8, 10, ...)

Find  $L \cap M$ . = (∅)

M: {Set of odd whole numbers}  
(1, 3, 5, 7, 9, ...)

Find  $L \cup M$ . = (Natural or counting numbers)  
 ↑  
 or