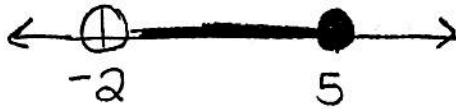


Do Now:

a. Graph  $\{x \mid -2 < x \leq 5\}$  on a number line.b. Graph  $\{x \mid x > 3\}$  on a number line.**AIM: EXPRESSING SOLUTIONS IN SET BUILDER NOTATION & INTERVAL NOTATION**

- Set: a collection of distinct objects or elements
- Roster: a list of elements in a set

1. Write a roster for the set for the following:

a. whole #'s less than 5

 $\{4, 3, 2, 1, 0\}$ 

b. integers from -3 to 2 inclusively

 $\{-3, -2, -1, 0, 1, 2\}$ 

- Set Builder Notation - mathematical shorthand for precisely stating all numbers of a specific set that possess a specific property
- $\{x \in \mathbb{R}\}$ : "x is an element of all real numbers"
- $\{x \mid \dots\}$ : "x such that....."
- Ex:  $\{x \mid 2 \leq x \leq 6\}$ : "x such that x is  $\geq$  2 and x is  $\leq$  6"

2. Write set builder notation for the following.

a) Real #'s greater than 0

$\{x > 0\}$

OR

$\{0 < x < \infty\}$   
 $(0, \infty)$

b) Real #'s less than or equal to 5

$\{x \leq 5\}$

OR

$\{-\infty < x \leq 5\}$   $(-\infty, 5]$

c) Real #'s from 8 to 20 inclusive

$\{8 \leq x \leq 20\}$

$[8, 20]$

d) Real #'s between 4 to 20

$\{4 < x < 20\}$

$(4, 20)$

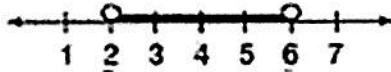
# Interval

Notation- a way of writing inequality expressions.

## Open Interval

- endpoints not included
- circles are open
- Use parentheses
- Infinity always has parenthesis

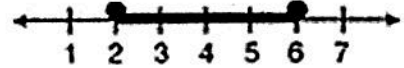
Example: (2,6)



## Closed Interval

- endpoints included
- circles are closed
- Use brackets

Example: [2,6]

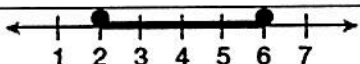
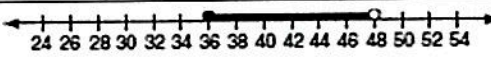
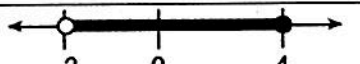
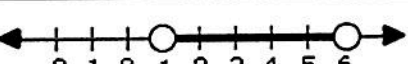
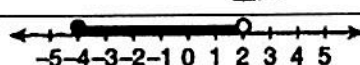
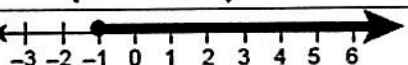


Now let's go back to #2 and write the examples in Interval Notation!

3. Write the following using **interval notation** for the following:

a) x is greater than or equal to -5 and less than 2.	b) $-3 < x \leq 12$	c) $-\infty < x < 12$	d) x is greater than 0 and less than or equal to 3
$[-5, 2)$	$(-3, 12]$	$(-\infty, 12)$	$(0, 3]$

Express the solutions in **set-builder notation** for part (a) and express the solutions in **interval notation** for part (b).

<p>4. </p> <p>a) Set-builder notation <math>\{2 \leq x \leq 7\}</math></p> <p>b) Interval notation <math>[2, 7]</math></p>	<p>5. </p> <p>a) Set-builder notation <math>\{36 \leq x &lt; 48\}</math></p> <p>b) Interval notation <math>[36, 48)</math></p>
<p>6. </p> <p>a) Set-builder notation <math>\{-3 &lt; x \leq 4\}</math></p> <p>b) Interval notation <math>(-3, 4]</math></p>	<p>7. </p> <p>a) Set-builder notation <math>\{1 &lt; x &lt; 6\}</math></p> <p>b) Interval notation <math>(1, 6)</math></p>
<p>8. </p> <p>a) Set-builder notation <math>\{-4 \leq x &lt; 2\}</math></p> <p>b) Interval notation <math>[-4, 2)</math></p>	<p>9. </p> <p>a) Set-builder notation <math>\{-1 \leq x &lt; \infty\}</math></p> <p>b) Interval notation <math>[-1, \infty)</math></p>