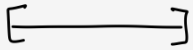
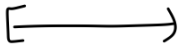
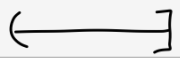
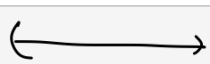
Intro to college math: Chapter 9.1
Interval Notation

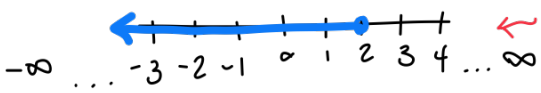
* Linear inequality: similar to linear equation except use

* Interval notation: used to write solution sets of inequalities.

	Interval	Inequality	Graph
1.	(a,b)	$a<x<b$	
2.	$[a,b]$	$a\leq x\leq b$	
3.	$[a,b)$	$a\leq x<b$	
4.	$(a,b]$	$a<x\leq b$	
5.	$[a,\infty)$	$x\geq a$	
6.	(a,∞)	$x>a$	
7.	$(-\infty,a]$	$x\leq a$	
8.	$(-\infty,a)$	$x<a$	
9.	$(-\infty,\infty)$	all real numbers	

1. Express the set $x \leq 2$ using interval notation.

$x \leq 2$ ← This says x is less than or equal to 2



← Think about what it would look like graphed on a number line.

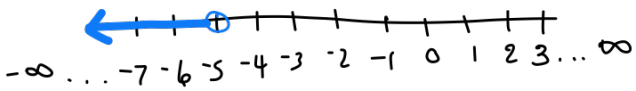
$(-\infty, 2]$

← * First write down number on the left that your graph will go to; here it's $-\infty$.
* Then write down number on the right your graph goes to. (separate the 2 numbers with a comma)

* Always place a parenthesis next to $-\infty$ or ∞.
* For a number, place parenthesis if no equal sign, $<$ or $>$
place brackets if there is equal sign, $\leq$ or $\geq$

2. Graph the inequality on the number line and then write it in interval notation. X < -5

$x < -5$



$(-\infty, -5)$

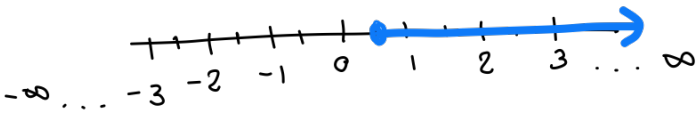
To Graph:
1) Since there is no equal sign, click on the open circle Below the graph.
2) Then click the number on the graph that was your answer.
3) Then click on the arrow box.
4) Then click on your circle on the graph and holding mouse click down drag the arrow all the way to the end (will see the arrow appear)

* Hint: Arrow will point in the same direction as inequality sign in problem.

To write interval notation:
A. Write down the number on the left that your graph will go to. It could be
B. Then write down the number on the right that your graph goes to. (Separate the two numbers with a comma.)
C. Always place parenthesis next to $-\infty$ or ∞
D. For a number: place parenthesis next to numbers without equal sign, < or >
   place brackets next to numbers with equal signs, $\leq$ or $\geq$

3. Graph the inequality on the number line and then write it in interval notation.

$x \geq 0.5$

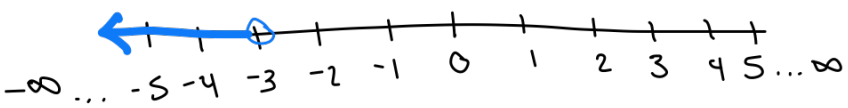


$[0.5, \infty)$

To Graph:
1) Since there is an equal sign with the inequality, click on the closed circle Below the graph.
2) Then click the number on the graph that was your answer.
3) Then click on the arrow box.
4) Then click on your circle on the graph and holding mouse click down drag the arrow all the way to the end (will see the arrow appear)

To write interval notation:
A. Write down the number on the left that your graph will go to. It could be
B. Then write down the number on the right that your graph goes to. (Separate the two numbers with a comma.)
C. Always place parenthesis next to $-\infty, \infty$
D. For a number: place parenthesis next to numbers without equal sign, < or >
   place brackets next to numbers with equal signs, $\leq$ or $\geq$

4. Which of the following choices corresponds to the graph?

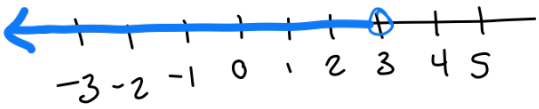


$(-\infty, -3)$

* Think of left most number 1st
* Then right most number.
* $-\infty$, or ∞ will always have Parenthesis
* If open circle, then use parenthesis
* If closed circle, use brackets.

5. Which of the following graphs corresponds to the following set?

$(-\infty, 3)$



* open circle at number, since it has parenthesis.
* arrow towards $-\infty$ side.

6. Write the set $\{x|-2 < x < 6\}$ using interval notation

$-2 < x < 6$

$(-2, 6)$

* write down the 2 numbers, seperated by a comma.
* Use parenthesis if $<$ or $>$ next to it
  Use bracket if $\leq$ or $\geq$ next to it.

7. Write the set $6 < x \leq 9$ using interval notation

$6 < x \leq 9$

$(6, 9]$

* write down the 2 numbers, seperated by a comma.
* Use parenthesis if $<$ or $>$ next to it
  Use bracket if $\leq$ or $\geq$ next to it.

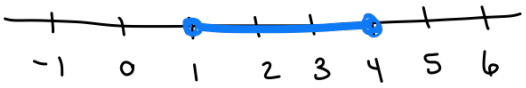
8. Express the set $-9 < x < 0$ using interval notation

$-9 < x < 0$

$(-9, 0)$

* write down the 2 numbers, seperated by a comma.
* Use parenthesis if $<$ or $>$ next to it
  Use bracket if $\leq$ or $\geq$ next to it.

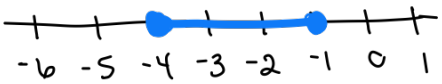
9. Write an interval notation to describe the set of values shown.



$[1, 4]$

* Going left to right, write down number with dots over them, seperated by a comma.
* If open circle, ○, then use Parenthesis
  If closed circle, ●, use brackets.

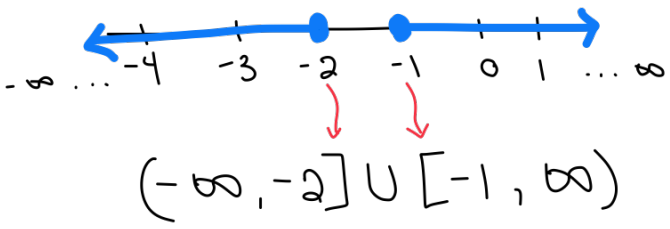
10. Write an interval notation to describe the set of values shown.



$[-4, -1]$

* Going left to right, write down number with dots over them, seperated by a comma.
* If open circle, ○, then use Parenthesis
  If closed circle, ●, use brackets.

11. Write the interval using interval notation to describe the set of values shown above. Use “U” between the two intervals.

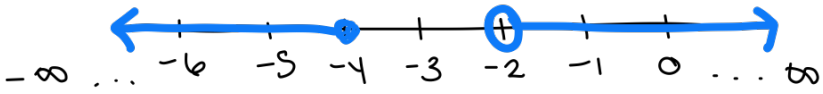


$(-\infty, -2] \cup [-1, \infty)$

* Starting left to right:
  - write down the numbers associated with each arrow.
* Place a "U" between them.

* Hint: When click on answer box, a box appears. Click on "Interval".

12. Write the interval using interval notation to describe the set of values shown above. Use “U” between the two intervals.



$(-\infty, -4] \cup (-2, \infty)$

* Starting left to right:
  - write down the numbers associated with each arrow.
* Place a "U" between them.