4.1 Writing and Solving Graphing Inequalities

inequality - a mathematical sentence that compares expressions using $<, >, \leq, \geq$

Inequality Symbols				
Symbol	$<$	$>$	$\leq$	$\geq$
Key Phrases	• is less than • is fewer than	• is greater than • is more than	• is less than or equal to • is at most • is no more than	• is greater than or equal to • is at least • is no less than

Write an inequality for each statement.

Ex 1: 5 more than a number is greater than or equal to -7.9

$x + 5 \geq -7.9$

Fill in the table.

Attraction	Restriction	Inequality
Dinosaur	Minimum is now 40 inches	$x \geq 40$
Primeval Whirl	Must be at least 48 inches	$x \geq 48$
Bay Slide	Must be under 60 inches	$x < 60$

Ex 2: A number x is at most -10.

$x \leq -10$

Ex 3: Twice a number y is more than $-\frac{1}{2}$.

$2y > -\frac{1}{2}$

solution of an inequality - a value that makes the inequality true, inequalities can have more than one solution

solution set - the set of all solutions of an inequality

Value of x	$x + 2 \leq -1$	Is the inequality true?
-2	$(-2)+2 \stackrel{?}{\leq} -1$ $0 \not\leq -1$	No
-3	$(-3)+2 \stackrel{?}{\leq} -1$ $-1 \leq -1$ ✓	Yes
-4	$(-4)+2 \stackrel{?}{\leq} -1$ $-2 \leq -1$ ✓	Yes

Tell whether -5 is a solution of each inequality.

Ex 4: $x + 12 > 7$

$(-5) + 12 \stackrel{?}{>} 7$

$7 \not> 7$

No

Ex 5: $1 - 2p \leq -9$

$1 - 2(-5) \stackrel{?}{\leq} -9$

$1 - (-10) \stackrel{?}{\leq} -9$

$1 + (+10) \stackrel{?}{\leq} -9$

$11 \not\leq -9$

No

Ex 6: $n \div 2.5 \geq -3$

$(-5) \div 2.5 \stackrel{?}{\geq} -3$

$\frac{-5}{2.5} \stackrel{?}{\geq} -3$

$-\frac{50}{25} \stackrel{?}{\geq} -3$

$-2 \geq -3$ ✓

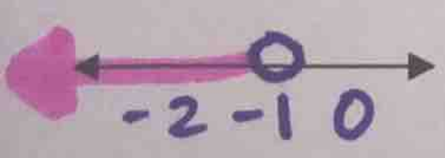
Yes

graph of an inequality - shows all solutions of the inequality on a number line, must contain the following 3 characteristics:

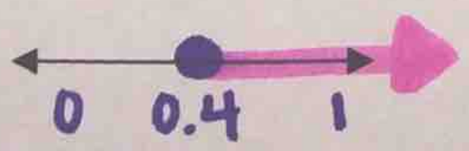
1. a number line - with numbers and arrows at both ends
2. an **open** circle if the number is **not** a solution, a **closed** circle if the number **is** a solution
3. an arrow to the left of right (in highlighter) showing that the graph continues forever in that direction

Graph the inequalities on a number line.

Ex 7: $x < -1$



Ex 8: $z \geq 0.4$



Ex 9: $-\frac{1}{2} < t$ ↪ $t > -\frac{1}{2}$