Unit 4

One-Step Equations & Inequalities

Checking Solutions to Equations
Solving Equations
Writing Equations
Checking Solutions to Inequalities
Writing Inequalities
Graphing Inequalities on Number Lines
Independent & Dependent Variables
Direct Variation

Advanced Math 6
Unit 4 Calendar

11/5	11/6	11/7	11/8	11/9
Unit 3 Touchstones	No School Election Day	Unit 4 Pre-Test and Preview	Equations and Checking Solutions to Equations	ESP AIMS Activity
11/12	**11/13**	**11/14**	**11/15**	**11/16**
Solving Addition and Subtraction Equations	Solving Multiplication and Division Equations	Equation Word Problems	Equation Review	Equations Test
11/19	**11/20**	**11/21**	**11/22**	**11/23**
Thanksgiving Break				
11/26	**11/27**	**11/28**	**11/29**	**11/30**
Inequalities	Inequalities	Direct Variation	Direct Variation	Quiz
12/3	**12/4**	**12/5**	**12/6**	**12/7**
Who's the Boss Performance Task	Who's the Boss Performance Task	Who's the Boss Performance Task	Review	Test

Unit 4: One-Step Equations and Inequalities Standards, Checklist and Concept Map

Georgia Standards of Excellence (GSE):

GSE6.EE.5: Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine if a given number in a set makes an equation or inequality true.

GSE 6.EE.6: Use variables to represent numbers and write expression when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set

GSE 6.EE.7: Solve real-world and mathematical problems by writing and solving equations of the form x+p=q and px=q for cases in which p,q and x are all nonnegative rational numbers.

GSE 6.EE.8 : Write an inequality of the form x > c or x < c to represent a constraint or condition in real-world problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

GSE 6.EE.9 : Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and use the equation d = 65t to show the relationship between distance and time.*

What Will I Need to Learn??

_____ Write expressions (from word problems) with a variable that represents a number

_____ To substitute to check the solution of an equation

_____ Write equations based on real-world problems

_____ Solve equations based on real-world problems

_____ To substitute to check the solution of an inequality

_____ Write inequalities to represent real-world problems and represent on number line

_____ Show relationships between two variables (independent and dependent) using an equation, a table, and a graph

Unit 4 Circle Map: Make a Circle Map below of important vocab and topics from the standards listed to the left.

Unit 4 - Vocabulary

Term	Definition
Constant of proportionality	The constant *k* in a direct variation equation; it is the ratio of $\frac{y}{x}$, or of $\frac{dependent\ variable}{independent\ variable}$. It is the same as unit rate.
Dependent Variable	The "output" or y value, which "depends" on the input (x value/independent variable)
Direct Proportion (Direct Variation)	A relationship between two variables, *x* (indpependent) and *y* (dependent) that can be written as *y-kx*, where $k \neq 0$
Equation	A mathematical sentence containing an equal sign, showing two equivalent values
Independent Variable	The "input" or x value, which determines the "output" or *y* value/dependent variable
Inequality	A statement showing that two values are NOT equal, using one of the following signs: $>, <, \geq, \leq$ or $\neq$
Inverse Operation	Opposite operations that "undo" each other
Variable	A symbol, usually a letter, that represents a number

Unit 4 – Vocabulary – <u>You Try</u>

Term	Definition
Constant of proportionality	
Dependent Variable	
Direct Proportion (Direct Variation)	
Equation	
Independent Variable	
Inequality	
Inverse Operation	
Variable	

Math 6 – Unit 4: One-Step Equations and Inequalities Review

1) What are inverse operations? _____

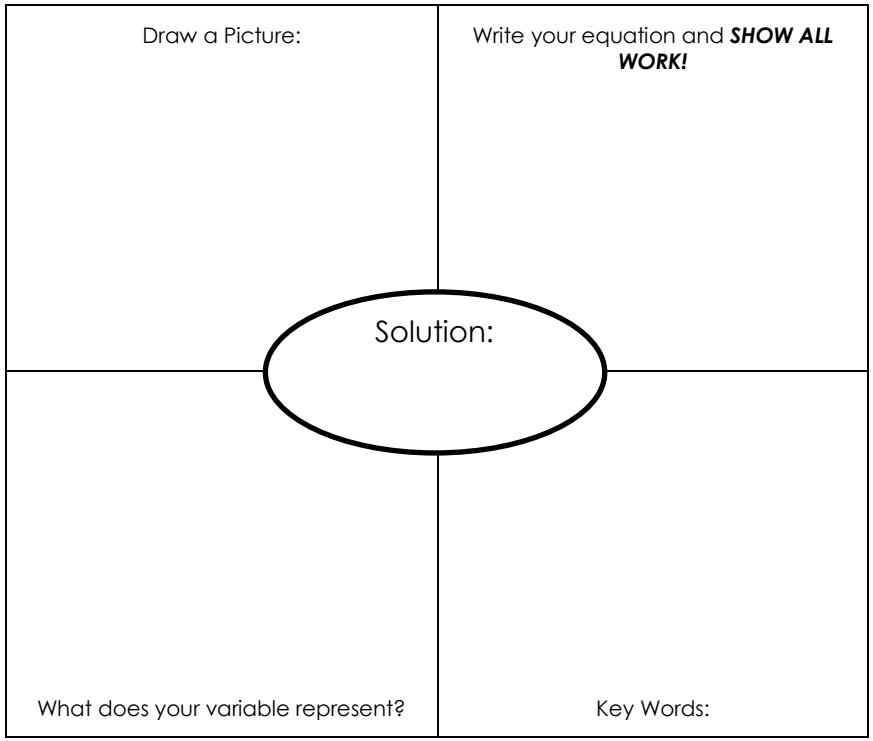
_____

2) Write 3 key words that tell you to do addition and 3 key words that tell you to do subtraction in a word problem.

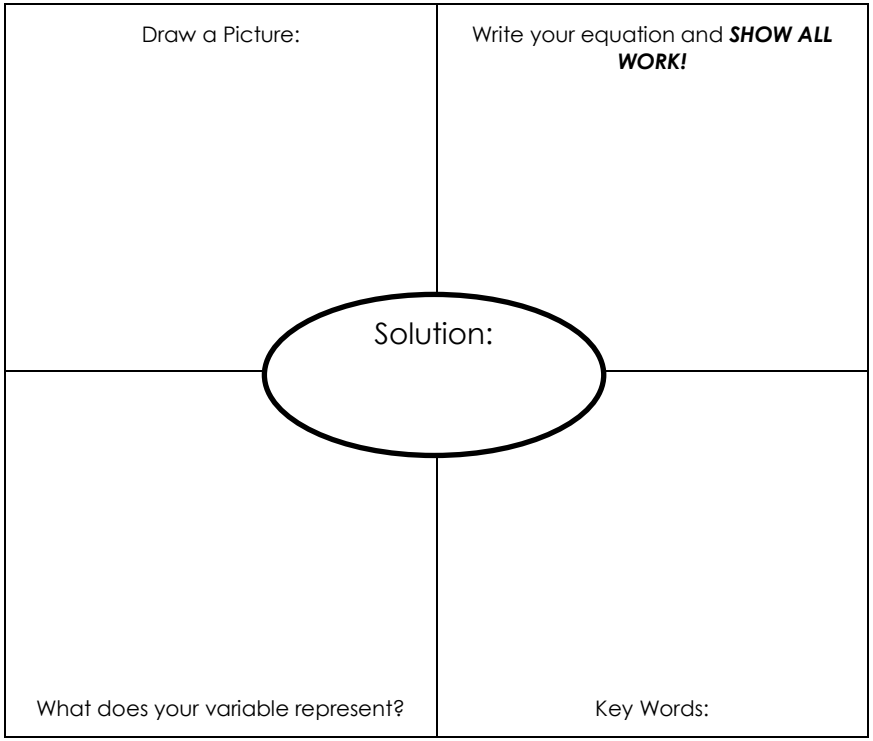
_____ _____ _____

_____ _____ _____

3) Jack's Candy Shop sold 8 lollipops today. He now has only 5 lollipops left to sell. How many lollipops did he have originally?



4) Alex has some flowers and picks two more for her bouquet. She now has 11 flowers. How many flowers did she start out with?



5) Mrs. Ledesma has x dollars. Amanda has 3 times more dollars than Mrs. Ledesma. If Amanda has $90, write an equation and solve for the number of dollars Mrs. Ledesma has.

Equation: _____ Solution: _____

Work:

6) Daneya spends half as many hours doing homework as her older brother, Dejon. If Dejon spends 4 hours doing homework, write an equation and solve for the number of hours, x, that Daneya does homework.

Equation: _____ Solution: _____

Work:

Solve each equation. Show all steps. Include a "check".

7) $m + 25 = 39$

8) $12x = 138$

9) $z - 29 = 8$

10) $\frac{y}{7} = 21$

11) $x + \frac{1}{4} = 3\frac{1}{2}$

12) $m - 2.8 = 5.2$

13) $3.5x = 70$

14) $\frac{m}{2} = 7.2$

15) Create your own word problem. Write an equation and show all the work to solve.

Equations & Parts of Equations

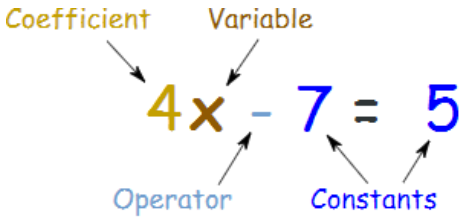
An _____ is a mathematical sentence containing an equal sign that shows two equivalent values.

$$x + 2 = 6$$

The equation says: **what is on the left (x + 2) is equal to what is on the right (6)**

So an equation is like a **statement** "*this* equals *that*".

Here we have an equation that says 4x − 7 equals 5, and all its parts:



A **Variable** is a symbol for a number we don't know yet. It is usually a letter like x or y.

A number on its own is called a **Constant**.

A **Coefficient** is a number used to multiply a variable (**4x** means **4** times **x**, so **4** is a coefficient)

An **Operator** is a symbol that shows an operation, ex: +, -, x, ÷.

Variables on their own (without a number next to them) actually have a coefficient of 1 (**x** is really the same as **1x**)

Solutions to Equations

Solutions to equations are values for the variables that make the **two sides equal**.

Think of a correct equation as a balanced scale.

If an equation has a variable you can check to see if a number is a solution to an equation by substituting the number in for the variable. If you get the same number on both sides, you have found a solution to the equation.

Example: EQUATION: $x + 15 = 27$

Is x=12 a solution?

x=12 is a solution because 12 + 15 = 27

Is x=10 a solution?

x=10 is NOT a solution because 10 + 15 ≠ 27

You Try:

1) Is x = 3 a solution to the equation, $x + 5 = 10$?
2) Is y = 5 a solution to the equation, $\frac{30}{y} = 6$??
3) Is z = 12 a solution to the equation, $8z = 95$?

You Try:

Determine if the following value for the variable is a solution to the equation. Write yes or no.

1) $9 + x = 21,\ for\ x = 11$
2) $n - 12 = 5,\ for\ n = 17$
3) $25r = 75,\ for\ r = 3$
4) $72 \div q = 8,\ for\ q = 9$
5) $28 + c = 43,\ for\ c = 15$
6) $u \div 11 = 10,\ for\ u = 111$
7) $\frac{k}{8} = 4,\ for\ k = 24$
8) $16x = 48,\ for\ x = 3$
9) $73 - f = 29,\ for\ f = 54$
10) $67 - j = 25,\ for\ j = 42$
11) $39 \div v = 13,\ for\ v = 3$
12) $88 + d = 100,\ for\ d = 2$
13) $14p = 20,\ for\ p = 5$
14) $6w = 30,\ for\ w = 5$
15) $7 + x = 70,\ for\ x = 10$
16) $6n = 174,\ for\ n = 29$

Replace each ◈ with a number that makes the equation correct.

17) $5 + 1 = 2 + ◈$
18) $10 - ◈ = 12 - 7$
19) $◈ \bullet 3 = 2 \bullet 9$
20) $28 \div 4 = 14 \div ◈$
21) $◈ + 8 = 6 + 3$
22) $12 \bullet 0 = ◈ \bullet 15$

23) Carla had $15. After she bought lunch, she had $8 left. Write an equation using the variable, x, to model this situation. What does your variable represent?

24) Seventy-two people signed up for the soccer league. After the players were evenly divided into teams, there were 6 teams in the league. Write an equation to model this situation using the variable, x.

Solving Equations

There are many different ways to solve equations, but in general, the best way to solve an equation is to use inverse operations.

Inverse operations are opposite operations that "undo" each other. **Addition** is the inverse operation of _____ and **subtraction** is the inverse operation of _____.

Multiplication is the inverse operation of _____ and **division** is the inverse operation of _____.

When you solve equations, you should:

1st **identify** the _____ you need.

2nd **apply** the **inverse operation** to _____ sides of the equation.

3rd **check** your solution by putting it back into the equation.

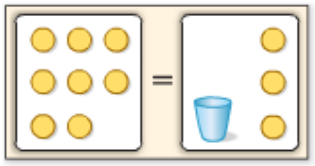
Example

Tutor

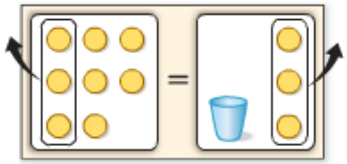
1. Solve $8 = x + 3$. Check your solution.

Method 1 **Use models.**

Model the equation using counters for the numbers and a cup for the variable.



Remove 3 counters from each side.



There are 5 counters remaining.

Method 2 **Use symbols.**

$8 = x + 3$ Write the equation.

$-3 = -3$ Subtract 3 from each side to "undo" the addition of 3 on the right.

$5 = x$

Check

$8 = x + 3$ Write the equation.

$8 \stackrel{?}{=} 5 + 3$ Replace x with 5.

$8 = 8$ ✓ This sentence is true.

+

Other Examples:

$x - 2 = 3$ Write the equation.

$+2 = +2$ Add 2 to each side.

$x = 5$ Simplify.

-

Check

$x - 2 = 3$ Write the equation.

$5 - 2 \stackrel{?}{=} 3$ Replace x with 5.

$3 = 3$ ✓ This sentence is true.

X

$2x = 10$ Write the equation.

$\frac{2x}{2} = \frac{10}{2}$ Divide each side by the coefficient 2.

$x = 5$

Check $2x = 10$ Write the original equation.

$2(5) \stackrel{?}{=} 10$ Replace x with 5.

$10 = 10$ This sentence is true. ✓

÷

$\frac{a}{3} = 7$ Write the equation.

$\frac{a}{3}(3) = 7(3)$ Multiply each side by 3.

$a = 21$ Simplify.

Check $\frac{a}{3} = 7$ Write the original equation.

$\frac{21}{3} \stackrel{?}{=} 7$ Replace a with 21.

$7 = 7$ This is a true sentence. ✓

Subtraction Property of Equality

Words If you subtract the same number from each side of an equation, the two sides remain equal.

Examples

Numbers	Algebra
$5 = 5$	$x + 2 = 3$
$-3 = -3$	$-2 = -2$
$2 = 2$	$x = 1$

When you solve an equation by subtracting the same number from each side of the equation, you are using the **Subtraction Property of Equality**.

You Try:

1) $c + 2 = 5$ 2) $6 = x + 5$ 3) $3.5 + y = 12.75$

Addition Property of Equality

Words If you add the same number to each side of an equation, the two sides remain equal.

Examples

Numbers	Algebra
$5 = 5$	$x - 2 = 3$
$+3 = +3$	$+2 = +2$
$8 = 8$	$x = 5$

When you solve an equation by adding the same number to each side of the equation, you are using the **Addition Property of Equality**.

You Try:

1) $x - 7 = 4$ 2) $y - 6 = 8$ 3) $9 = a - 5$

Division Property of Equality

Words If you divide each side of an equation by the same nonzero number, the two sides remain equal.

Examples

Numbers	Algebra
$18 = 18$	$3x = 12$
$\frac{18}{6} = \frac{18}{6}$	$\frac{3x}{3} = \frac{12}{3}$
$3 = 3$	$x = 4$

When you solve an equation by dividing both sides of the equation by the same number, you are using the **Division Property of Equality**.

You Try:

1) $3x = 15$ 2) $8 = 4x$ 3) $2x = 14$

Multiplication Property of Equality

Words If you multiply each side of an equation by the same nonzero number, the two sides remain equal.

Examples

Numbers	Algebra
$3 = 3$	$\frac{x}{4} = 7$
$3(6) = 3(6)$	$\frac{x}{4}(4) = 7(4)$
$18 = 18$	$x = 28$

When you solve an equation by multiplying each side of the equation by the same number, you are using the **Multiplication Property of Equality**.

You Try:

1) $\frac{x}{8} = 9$ 2) $\frac{y}{4} = 8$ 3) $\frac{m}{5} = 9$

More Equation Solving (+/-)

Solve each equation. Show <u>ALL</u> your work.

1) x + 4 = 5	2) x – 1 = 3
3) y – 3 = 4	4) y + 5 = 5
5) s + 8 = 9	6) s – 7 = 0
7) n – 6 = 3	8) n + 9 = 11

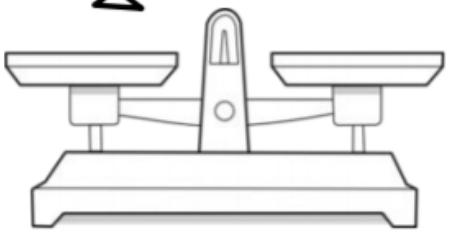
More Equation Solving (x/÷)

Solve each equation. Show <u>ALL</u> your work.

1) 5x = 25	2) $\frac{y}{4} = 7$
3) $\frac{n}{2} = 19$	4) 6g = 54
5) 8b = 64	6) $\frac{h}{6} = 11$
7) $\frac{f}{4} = 9$	8) 7s = 49

one step equations

GOAL OF SOLVING EQUATIONS:



STEPS:

1. DO THE OPPOSITE OPERATION OF WHAT'S ON THE SAME SIDE AS THE VARIABLE TO BOTH SIDES
2. CHECK YOUR SOLUTION

REMEMBER
ADD & SUBTRACT ARE INVERSE OPERATIONS. MULTIPLY & DIVIDE ARE INVERSE OPERATIONS.

Try it!

-2x = 22

x - 9 = -3

Always remember to check your answer by substituting it in for x. Both sides of the equation should be equal!

In an equation chain, you use the solution of one equation to help you find the solution of the next equation in the chain. The last equation in the chain is used to check that you have solved the entire chain correctly.

Complete each equation chain:

1)	5 + a = 12	so a = _____
	ab = 14	so b = _____
	16 ÷ b = c	so c = _____
	14 – d = c	so d = _____
	e ÷ d = 3	so e = _____
	a + e = 25	***check***

2)	9f = 36	so f = _____
	g = 13 - f	so g = _____
	63 ÷ g = h	so h = _____
	h + i = 18	so i = _____
	j – i =9	so j = _____
	j ÷ f = 5	***Check***

3)	m ÷ 4 = 8	so m = _____
	m – n = 12	so n = _____
	np = 100	so p = _____
	q = 40 + p	so q = _____
	p + q -10 = r	so r = _____
	r – m = 8	***check***

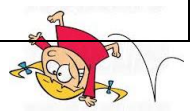
2)	18 = v - 12	so v = _____
	v ÷ w = 3	so w = _____
	80 = wx	so x = _____
	w + x = 2y	so y = _____
	xy – z = 40	so z = _____
	z - v = 2	***Check***

Challenge: Create your own equation chain using these numbers for the variables: a = 10, b = 6, c = 18 and d = 3

Equations Error Analysis

Sally is a silly little girl who makes mistakes! In Column #1, analyze her work and *circle her mistake*. In Column #2, explain what she did wrong. In Column #3, show how Silly Sally should work out the problem correctly. Show ALL work!

Silly Sally's Work (Circle her mistake):	**What did Silly Sally do wrong?**	**Show Silly Sally how it's done! (Show ALL steps!)**
$x + 5 = 28$ $+5 \quad +5$ $x = 33$		
$\frac{12a}{12} = \frac{108}{12}$ $a = 8$		
$w - 42 = 18$ $+18 \quad +18$ $w = 36$		
$\frac{y}{15} = 3$ $\div 15 \quad \div 15$ $y = 5$		
$x + 23.45 = 32$ $-23.45 \quad -23.45$ $x = 9.45$		
$4\frac{1}{2}b = 36$ $\cdot 4\frac{1}{2} \quad \cdot 4\frac{1}{2}$ $b = 162$		



Solving One-Step Equations Problems

You can solve a word problem using one-step equations.

1) Figure out **what you know** and **what you want to know**. What you want to know will be represented by a **variable**.
2) Set up an **equation** to solve for the unknown (variable).
3) Use **inverse operations** to solve.
4) Don't forget to **label** your solution and write it as statement.

Example:

Edgar jogs for 20 minutes. He stretched then jogs some more. Altogether, he jogs for 35 minutes. How far does he jog after he stretches?

What do you know? _____

What do you want to know? _____

What does your variable represent? _____

What operation is used in the equation? _____

What inverse operation will you use to solve? _____

Write the one-step equation to solve. _____

Solution: _____

Solution as a statement: _____

You Try:

1) Jan used 22 gallons of water in the shower. This amount is 7 gallons less than the amount she used for washing clothes. How much water does Jan use to wash clothes?

What do you know? _____

What do you want to know? _____

What does your variable represent? _____

What operation is used in the equation? _____

What inverse operation will you use to solve? _____

Write the one-step equation to solve. _____

Solution: _____

Solution as a statement: _____

2) While training for a sports event, Oliver hiked 5.3 miles each day. If he hiked for a total of 42.4 miles, how many days did Oliver hike?

What do you know? _____

What do you want to know? _____

What does your variable represent? _____

What operation is used in the equation? _____

What inverse operation will you use to solve? _____

Write the one-step equation to solve. _____

Solution: _____

Solution as a statement: _____

3) At a restaurant, Erin and her three friends decided to split the bill evenly. If each person paid $11 what was the total cost of their bill?

What do you know? _____

What do you want to know? _____

What does your variable represent? _____

What operation is used in the equation? _____

What inverse operation will you use to solve? _____

Write the one-step equation to solve. _____

Solution: _____

Solution as a statement: _____

4) Ronique had 3 cookies and then she bought some more and then she had a total of 19 cookies. How many cookies did she buy?

What do you know? _____

What do you want to know? _____

What does your variable represent? _____

What operation is used in the equation? _____

What inverse operation will you use to solve? _____

Write the one-step equation to solve. _____

Solution: _____

Solution as a statement: _____

Additional One-Step Equation Practice

1) Robyn had some video games, and then bought 4 more games. If she now has a total of 10 games, how many did she start out with?

What does your variable represent in the word problem? _____

What operation will you use to solve the word problem? _____

One Step Equation: _____

Solution: _____

2) Three friends found some money on the playground. They split the money evenly, and each person got $14. How much money did they find on the playground?

What does your variable represent in the word problem? _____

What operation will you use to solve the word problem? _____

One Step Equation: _____

Solution: _____

3) Josh sent 574 text messages over the last 7 days. On average, how many text messages did he send each day?

What does your variable represent in the word problem? _____

What operation will you use to solve the word problem? _____

One Step Equation: _____

Solution: _____

4) In a recent presidential election, Ohio had 18 electoral votes. This is 20 votes less than Texas had, how many electoral votes did Texas have?

What does your variable represent in the word problem? _____

What operation will you use to solve the word problem? _____

One Step Equation: _____

Solution: _____

Solve each equation below:

5) $2.3 = x + 0.34$

6) $p + \frac{1}{7} = \frac{6}{7}$

7) $\frac{3}{4}d = 12$

8) $19 = \frac{x}{7}$

9) $h - 26 = 29$

10) $1.6w = 72$

11) $12.22 = y - 7.5$

12) $38.2 = 4x$

Inequalities

An _____ is a mathematical sentence that compares two quantities. We use the symbols and wording below to write inequalities.

Symbol	Meaning/Word Phrases	Example
$<$	is less than is fewer than is below	$3 < 5$
$>$	is greater than is more than is above	$8 > 4$
$\leq$	is less than or equal to at most no more than	$7 \leq 10$ $10 \leq 10$
$\geq$	is greater than or equal to at least no less than	$12 \geq 9$ $12 \geq 12$

Determining if a number is a solution to an inequality requires you to substitute the value into the inequality and check to see if the value makes the inequality true.

Example:

The "Dollar Savers" store sells everything less than $5. Would you be able to buy the following items at the "Dollar Savers" store? Use the inequality $x < 5$ to substitute. Circle Yes or No.

$2

Yes No

$5

Yes No

$4.50

Yes No

$5.25

Yes No

You Try:

1) To ride a roller coaster, you must be at least 48" tall. Write an inequality and substitute to determine who can ride the roller coaster. Circle Yes or No.

Silly Steve

40"

Yes No

Cool Carl

36"

Yes No

Laughing Lou

48"

Yes No

Toothy Tim

52"

Yes No

Circle all of the values that will satisfy each of the given inequalities.

2) $y > 8$	6	8	9	15
3) $m \leq 525$	525	510	500	650
4) $c < 22$	12	25	30	22
5) $f \geq 80$	81	0	75	80
6) $g \geq 27$	27	26	25	20
7) $n < 16$	15	10	0	16
8) $a > 48$	36	48	24	64
9) $z \leq 100$	55	3	110	100

Writing Inequalities

Inequalities can be written to represent many situations.

Examples:

There are at least 25 students in the auditorium.

$n \geq 25$ "at least" means greater than or equal to

n represents the number of students in the auditorium

No more than 150 people can occupy the room.

$r \leq 150$ "no more than" means less than or equal to

r represents the possible room capacity

You Try:

Write an inequality for each given situation.

1) You cannot eat more than 2 pieces of your Halloween candy per day.

2) There are less than 15 people in the room.

3) There are at most 12 books on a shelf.

4) There are fewer than 200 people at the game.

5) You must get at least 30 minutes of exercise each day.

6) You must be at least 15 years old to get your driver's permit.

7) A pony is less than 14.2 hands tall.

8) You must be over 12 years old to ride the go karts.

9) The pig weighs at most 220 pounds.

10) Every candy bar costs at least $2.20.

11) You must complete at least 80% of your homework to attend the Homework Stars Celebration.

12) There are no more than seven people on the boat.

13) More than 40 people attended the movie last night.

14) You must be under 54" to ride the kiddie rides at Six Flags.

15) Getting at least 8 hours of sleep at night keeps you healthy.

Graphing Inequalities

Inequalities can be graphed on a number line to illustrate all of the possible solutions.

1st draw a number line and include the number in your inequality.

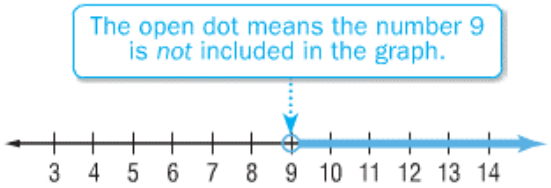
2nd draw an open or closed dot on the number (depending on which inequality symbol is in the inequality. Use an open dot (○) if the inequality has the greater than (>) or less than (<) symbol. Use a solid dot (•) if the inequality has the greater than or equal to (≥) or less than or equal to (≤) symbol.

3rd draw a line and an arrow that shows all of the possible solutions.

Examples:

***n* > 9**

Place an open dot at 9. Then draw a line and an arrow to the right.

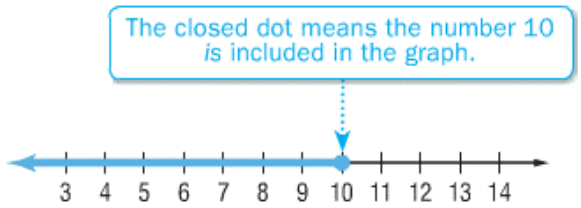


The values that lie on the line make the sentence true. All numbers greater than 9 make the sentence true.

equal to means included

***n* ≤ 10**

Place a closed dot at 10. Then draw a line and an arrow to the left.



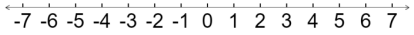
All numbers 10 and less make the sentence true.

TIP: If you keep the variable on the LEFT, the arrow at the end of your number line looks just like your inequality symbol.

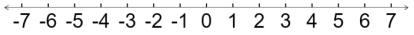
You Try:

Graph the following inequalities on a number line. Then write a word phrase to describe each inequality.

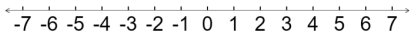
1) n ≤ -5



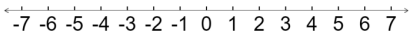
2) n ≤ 5



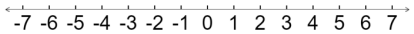
3) n < 1



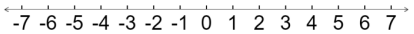
4) r > 2



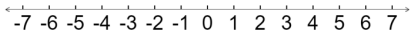
5) n > 5



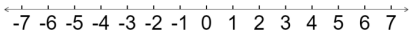
6) n ≤ -2



7) n ≥ -7



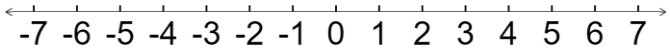
8) n < 0



Write the inequality AND graph for each problem below in 7 - 10

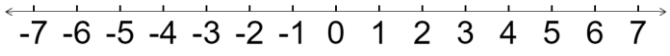
7) Fetty Wap has **at least 3 fans** in Mrs. Ledesma's 3rd period math class.

Inequality: _____

Graph: 

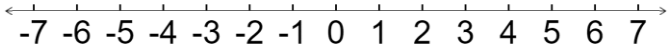
8) Mr. Shaw should send Mrs. Shaw **more than 6 roses per day**.

Inequality: _____

Graph: 

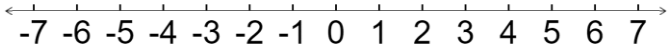
9) Shawn snuck into a G Rated movie because he thought you had to be **at most 7 years old**.

Inequality: _____

Graph: 

10) When trick or treating, Daniella's dream came true. A lady told her she could take **no less than 5 pieces of candy**.

Inequality: _____

Graph: 

More Practice with Inequalities

Write an inequality for each situation, and graph on a number line.

1) Students must score at least 800 to pass the CRCT.

2) You must be shorter than 48" to ride the kiddie train.

3) You should brush your teeth at least twice a day.

4) A good credit score is higher than 699.

5) Classes can have no more than 34 students.

6) AJ needs to save more than $500.

7) A book costs less than $20

More Inequalities Practice

1) Which number is a solution to the inequality below?
x > 4

a) 1 b) 2
c) 4 d) 5

2) Which number is NOT a solution to the inequality below? **x ≤ 8**

a) 6 b) 7
c) 8 d) 9

3) Which statement describes "a number more than 22"?

a) x < 22 b) x > 22
c) x ≤ 22 d) x ≥ 22

4) Which statement describes "a number less than or equal to 43"?

a) x < 43 b) x > 43
c) x ≤ 43 d) x ≥ 43

5) Which statement describes " a number no more than 17"?

a) x < 17 b) x > 17
c) x ≤ 17 d) x ≥ 17

6) Which statement describes "at least 32"?

a) x < 32 b) x > 32
c) x ≤ 32 d) x ≥ 32

7) Which number is a solution to x + 4 > 12

a) 3 b) 5
c) 7 d) 9

8) Which number is **NOT** a solution to **x – 3 < 10**

a) 7 b) 8
c) 10 d) 14

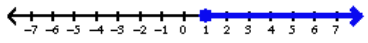
9) Which number is a solution to **3x > 12**

a) 4 b) 5
c) 2 d) 3

10) Which number is **NOT** a solution to **2x ≤ 10**

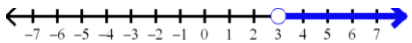
a) 3 b) 4
c) 5 d) 6

11) Which inequality matches the graph below?



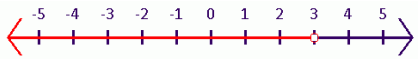
a) n > 1 b) n ≤ 1
c) n ≥ 1 d) n ≥ -1

12) Which inequality matches the graph below?



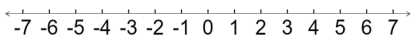
a) v > -3 b) v > 3
c) v ≤ -3 d) v < 3

13) Which inequality matches the graph below?



a) x > 3 b) x < 3
c) x ≤ 3 d). x ≥ 3

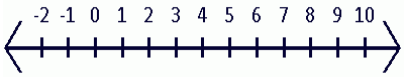
14) Which inequality matches the graph below?



a) n < 0 b) n ≤ 0
c) n ≥ 0 d) n > 0

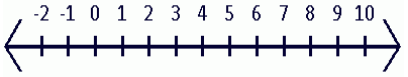
15) Solve x + 11 > 19

16) Graph the solution to the inequality from question #15.



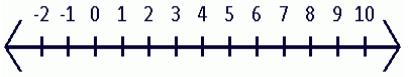
17) Solve x – 3 ≤ 5

18) Graph the solution to the inequality from question #17.



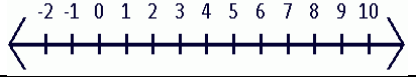
19) Solve 3x < 12

20) Graph the solution to the inequality from question #19.



21) Solve $\frac{x}{4} \geq 2$

22) Graph the solution to the inequality from question #21.



23. Write an inequality for this statement "x is less than or equal to 7".

24. Write an inequality for this statement

"x is greater than -9"