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

Unit 4 IXL Log

	Required Skills	
	Skill	**Your Score**
Week of 9/30	Z.1 (Does x satisfy an equation?)	
	Z.4 (Model and solve equations with algebra tiles)	
	Z.6 (Solve one-step equations with whole #s)	
	Z.7 (Solve one-step equations with decimals, fractions, and mixed numbers)	
Week of 10/7	Z.3 (Write an equation from words)	
	Z.8 (Solve one-step equation word problems)	
	R.14 (Identify proportional relationships from graphs)	
	R.15 (Identify proportional relationships from tables)	
	R.17 (Interpret graphs of proportional relationships)	
Week of 10/14	AA.1 (Solutions to inequalities)	
	AA.2 (Graph inequalities on number lines)	
	AA.3 (Write inequalities from number lines)	
	AA.4 (Solve one-step inequalities)	

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

Math 6/7
Unit 4 Calendar

10/21	10/22	10/23	10/24	10/25
Unit 4 Pre-test Vocab, Intro to Equations	AIMS Expression Activity	Solving One-Step Equations	Computer Lab; Intro to Project	HW Stars Reward
10/28	**10/29**	**10/30**	**10/31**	**11/1**
Equation Word Problems	Equation Word Problems	Direct Variation	Direct Variation	Quiz
11/4	**11/5**	**11/6**	**11/7**	**11/8**
Inequalities	No School Election Day	Computer Lab	Inequalities	Brief Quiz on Inequalities
11/11	**11/12**	**11/13**	**11/14**	**11/15**
Who's the Boss Performance Task	Who's the Boss Performance Task	Who's the Boss Performance Task	Review	Test

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 and/or Example
Constant of proportionality	
Dependent Variable	
Direct Proportion (Direct Variation)	
Equation	
Independent Variable	
Inequality	
Inverse Operation	
Variable	

Math 6/7 – Unit 4: One-Step Equations and Inequalities Study Guide

1) Thoroughly explain how to solve an equation.

2) Explain how to graph the solution to an inequality.

Solve each equation. Remember to show all work and **perform the inverse operation to BOTH sides of the equation!**

3) $t - 2\frac{1}{2} = 2\frac{1}{2}$

4) $\frac{n}{0.2} = 100$

5) $r + 19.85 = 49$

6) $5.5x = 44$

Write and graph the solution to each inequality.

7) Andrea's grade was higher than an 85. _____

8) The speed limit is 45 miles per hour. _____

9) Riders must be at least 54'' tall to ride the Goliath. _____

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

Equation: _____   Solution: _____

Work:

11) Fiona had x dollars in her bank account. After spending $675 on Christmas gifts, she has $562.57 left in her account.
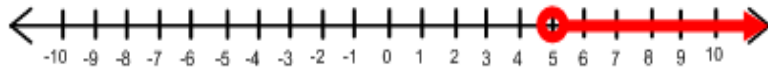
Equation: _____   Solution: _____

Work:

12) The weight limit on a cargo plane is 20 Tons. Write an inequality to represent the weight limit, w, and graph it.

Inequality:_____

13) What inequality is graphed on the number line? _____

14) Which of the following is NOT a solution to $8 \leq z$?

A. 7   B. 8   C. 9   D. 10

15) Write an equation for each scenario. Then, solve each one.

A. Jamie sold 240 newspaper subscriptions each month for 12 months. What is x, the total number of newspaper subscriptions that Jamie sold in 1 year?

Equation:_____   Solution: _____
Work:

B. Brenna cycled a total of 240 miles this month. She cycled 12 miles less this month than last month. What is x, the number of miles Brenna cycled last month?

Equation:_____   Solution: _____
Work:

C. Mary charges $12 per hour for labor to paint houses. What is x, the number of hours Mary worked if she charged $240 for labor?

Equation:_____   Solution: _____
Work:

D. Sara bought 12 ride tickets and x game tickets. How many game tickets did she buy if she bought 240 tickets in all?

Equation:_____   Solution: _____
Work:

15) Which table satisfies the equation $y = \frac{1}{4}x$?

A.

x	0	1	4	12	100
y	0	0.25	1	3	25

C.

x	0	1	2	3	4
y	0.25	4	5.6	11	12.5

B.

x	0	1	2	5	8
y	0	4	8	20	32

D.

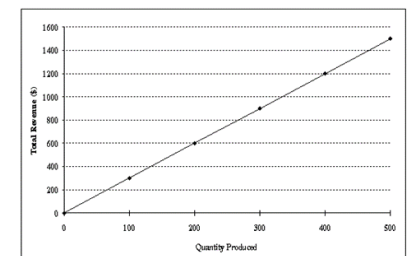| x	0	2	4	6	8
y	0	0.5	2	12	18

16) What equation is shown?

a. $y = \frac{1}{3}x$ b. $y = 2x$

c. $y = 3x$ d. $y = 10x$

Solutions to Equations

Solutions to equations are values for the variables that make the **two sides equal**.
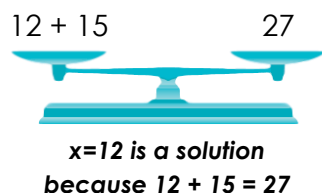
Think of a correct equation as a balanced scale.

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?   ***Is x=10 a solution?***

x=12 is a solution   *x=10 is NOT a solution*
because 12 + 15 = 27   *because 10 + 15 ≠ 27*
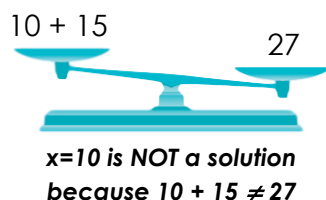
You Try:

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) $◈ \cdot 3 = 2 \cdot 9$

20) $28 \div 4 = 14 \div ◈$

21) $◈ + 8 = 6 + 3$

22) $12 \cdot 0 = ◈ \cdot 15$

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 _____.

Steps to Solving Equations:

1st **Identify** the _____ _____.

2nd **Apply** the **inverse operation** to _____ sides of the equation to keep it balanced.

3rd **Check** your solution by substituting it back into the equation.

+

−

Solving Equations

X

÷
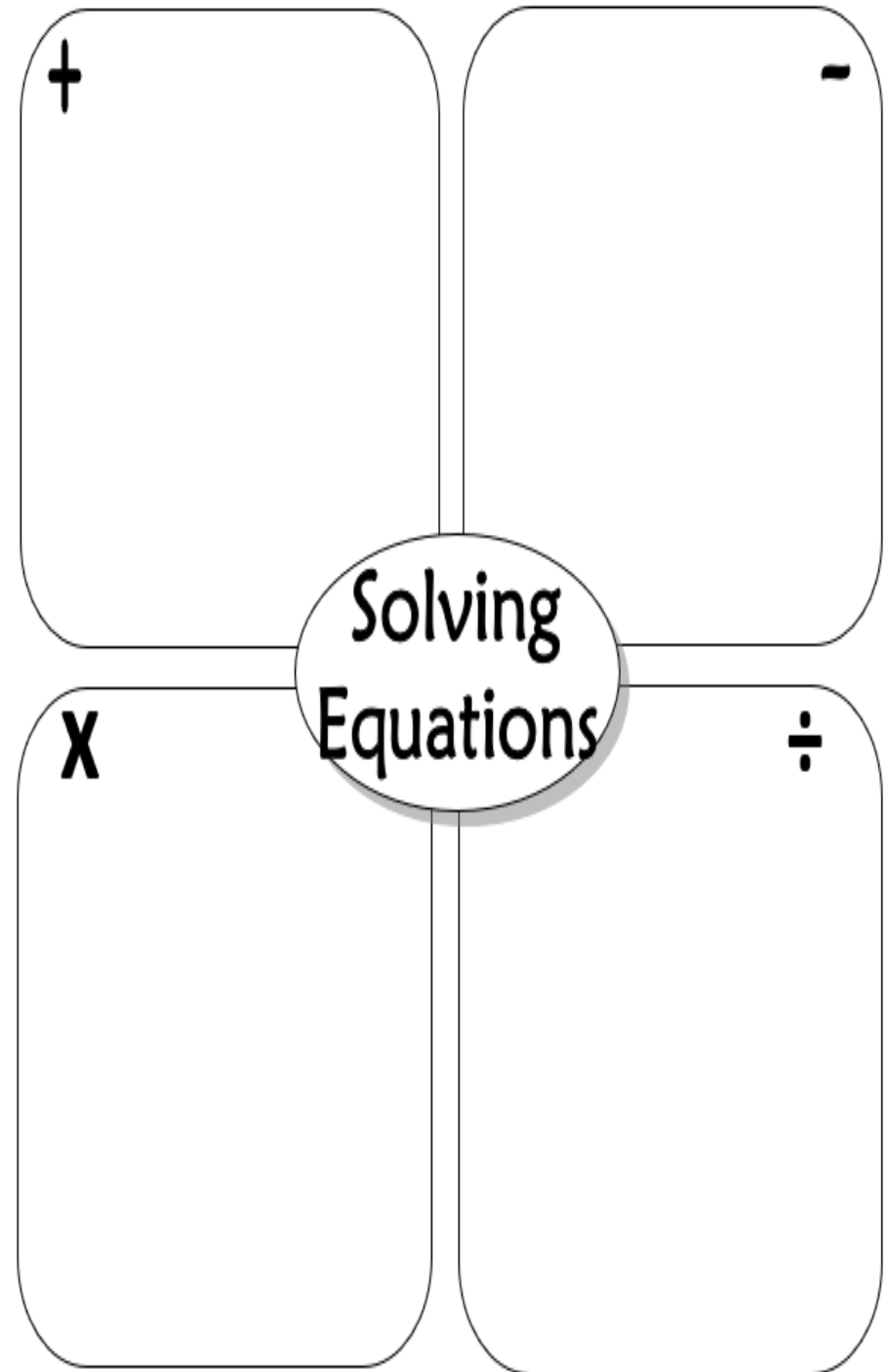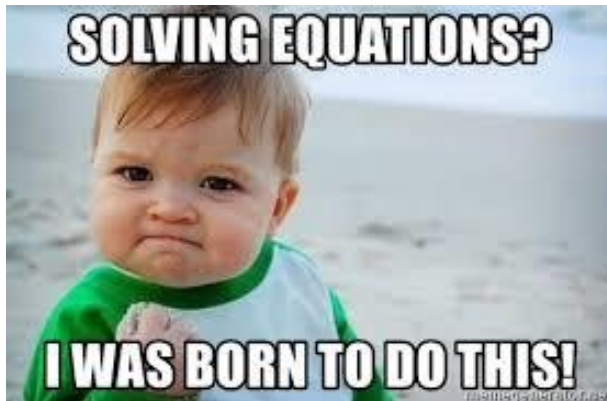
Subtraction Property of Equality

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

Examples

Numbers
$$5 = 5$$
$$-3 = -3$$
$$2 = 2$$

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

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) $3.5 + y = 12.7$

Addition Property of Equality

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

Examples

Numbers
$$5 = 5$$
$$+3 = +3$$
$$8 = 8$$

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

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
$$18 = 18$$
$$\frac{18}{6} = \frac{18}{6}$$
$$3 = 3$$

Algebra
$$3x = 12$$
$$\frac{3x}{3} = \frac{12}{3}$$
$$x = 4$$

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
$$3 = 3$$
$$3(6) = 3(6)$$
$$18 = 18$$

Algebra
$$\frac{x}{4} = 7$$
$$\frac{x}{4}(4) = 7(4)$$
$$x = 28$$

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 __ALL__ your work.

1) x + 4 = 51	2) x − 87 = 300
3) y − 45 = 45	4) y + 51 = 498
5) s + 2.88 = 9	6) s − 7.65 = 11.3
7) n − 4 ⅝ = 3 ⅜	8) n + 9 ⅝ = 11 ¼

More Equation Solving (x/÷)

Solve each equation. Show __ALL__ your work.

1) 5x = 250	2) $\frac{y}{14} = 7$
3) $\frac{n}{2} = 19$	4) $\frac{1}{6}g = 54$
5) 8.5b = 68	6) $\frac{h}{6} = 1.01$
7) $\frac{f}{4} = 9.25$	8) 7s = 4.9

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!)
$x + 5 = 28$ $\underline{+5 \quad +5}$ $x \qquad = 33$		
$\dfrac{12a}{12} = \dfrac{108}{12}$ $a = 8$		
$w - 42 = 18$ $\underline{+18 \quad +18}$ $w \qquad = 36$		
$\dfrac{y}{15} = 3$ $\underline{\div 15 \quad \div 15}$ $y \quad = 5$		
$x + 23.45 = 32$ $\underline{-23.45 \quad -23.45}$ $x = 9.45$		
$4\dfrac{1}{2}b = 36$ $\bullet 4\dfrac{1}{2} \quad \bullet 4\dfrac{1}{2}$ $b = 162$		

Equation Chains

Complete each equation chain:

1)
$5 + a = 12$ so a = _____
$ab = 14$ so b = _____
$16 \div b = c$ so c = _____
$14 - d = c$ so d = _____
$e \div d = 3$ so e = _____
$a + e = 25$ **check**

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

3)
$m \div 4 = 8$ 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 = _____
$v \div w = 3$ 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

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 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: _____

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 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 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: _____

One-Step Equation Word Problems

For each problem, write the equation. Show ALL steps to solve.

1) Robyn had some video games, and then bought 13 more games. If she now has a total of 31 games, how many did she start out with?

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?

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

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?

5) Angelica spent $1.60 per mile in an Uber. If she paid a total of $8.80, how many miles did she travel?

6) Laiyanna gave 3/14 of her scrunchies to Lizzy. If she gave Lizzy 15 scrunchies, how many did Laiyanna begin with?

7) Do the equations $\frac{1}{5}y = 25$ and $\frac{y}{5} = 25$ have the same solutions? Show your work and explain your findings.

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
≤	is less than or equal to at most no more than	7 ≤ 10 10 ≤ 10
≥	is greater than or equal to at least no less than	12 ≥ 9 12 ≥ 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	$5	$4.50	$5.25
Yes No	Yes No	Yes No	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"	Cool Carl 36"	Laughing Lou 48"	Toothy Tim 52"
Yes No	Yes No	Yes No	Yes No

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

2) y > 8   6   8   9   15

3) m ≤ 525   525   510   500   650

4) c < 22   12   25   30   22

5) f ≥ 80   81   0   75   80

6) g ≥ 27   27   26   25   20

7) n < 16   15   10   0   16

8) a > 48   36   48   24   64

9) z ≤ 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:

$n > 9$

The open dot means the number 9 is *not* included in the graph.

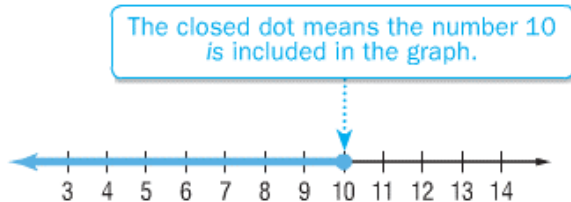Place an open dot at 9. Then draw a line and an arrow to the right.
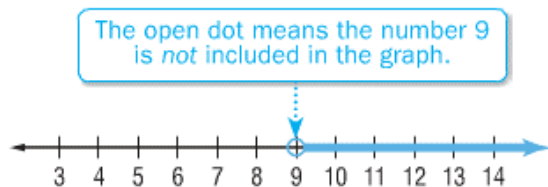
The values that lie on the line make the sentence true. All numbers greater than 9 make the sentence true.

equal to means included

$n \leq 10$

The closed dot means the number 10 *is* included in the graph.

Place a closed dot at 10. Then draw a line and an arrow to the left.
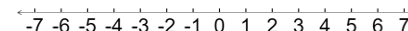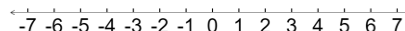
All numbers 10 and less make the sentence true.

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

Graph the following inequalities on a number line. Then write a <u>*word phrase*</u> *to describe each inequality.*
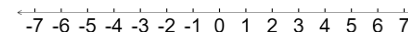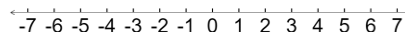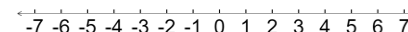
1) $n \leq -5$

-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7

_____

2) $n \leq 5$

-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7

_____

3) $n < 1$

-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7

_____

4) $r > 2$

-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7

_____

5) $n > 5$

-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7

_____

6) $n \leq -2$

-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7

_____

7) $n \geq -7$

-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7

_____

8) $n < 0$

-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7

_____
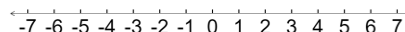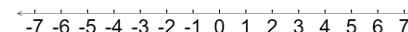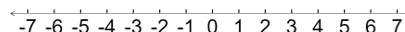
More Practice with Inequalities

Write an inequality for each problem & 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.
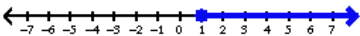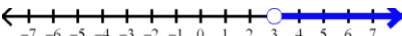
5) Classes can have no more than 34 students.

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

Putting It All Together...
What exactly IS Direct Variation??

What?	Meaning...	Example:
1: The Situation	You have a problem or situation with a _____ variable; in other words, one number, the "k", will stay the same.	Bozo performs in 10 circus acts per day. *(10 is the constant, k, because it stays the same)*
2. The Rule	An equation written as _____, where k is the constant.	y = 10x *(x represents the # days* *y represents the total # of circus acts)*
3. The Table of Ordered Pairs (x,y)	For every _____, x, there is one _____, y. Each (x,y) pair gives you an ordered pair you can graph on a coordinate plane. FYI: The x value is the _____ variable, and the y value is the _____ variable.	Plug in input values for x. In 0 days, Bozo performs 0 times. In 1 day, he performs 10 times, and so on. Write the data in a table: | X	Y
---	---
0	0
1	10
2	20
3	30	 *Each set is an ordered pair to be graphed, such as (0,0), (1,10), etc.*
4. The Graph	The ordered pairs can be _____. Because x and y vary proportionally, they will ALWAYS: 1) start at (0,0) 2) form a straight line	Bozo's Performances total perfs. # days

An iPod Nano can hold up to 16 gigabytes (GB) of data.

1) How many gigabytes can be stored on 0 iPod Nanos? _____

   1? _____

   5? _____

   12? _____

2) If you have enough iPod Nanos to hold 80 GB, how many of them do you have? _____

3) Fill in the table:

X (# of iPods)	0	2			25
Y (total GB)			64	160	

4) What is the direct variation equation (in the terms of y=kx)? _____

5) Based on this problem, answer the following. (Hint: Refer to the table in #3.)

   a. In words, what does the input (x) represent? _____

   b. In words, what does the output (y) represent? _____
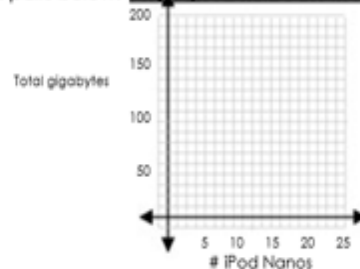
   c. In words, what does the constant (k) represent? _____

6) As the number of iPod Nanos increases, the total number of gigabytes _____.

7) Look at the values in the table on #3. Write each set of (x,y) values as an ordered pair.

   (0, 0)   (2,   )   _____   _____   _____

8) Graph these ordered pairs below. **Gigabytes on iPod Nanos**

Total gigabytes

iPod Nanos

Practice with Functions and Tables

Just the Basics ~

_____ represents the "constant of proportionality," or unit rate. As x and y values change, this stays th same.

_____ is the _____ relation between 2 quantities that are proportional (they have t same unit rate).

When one variable increases, the _____ other variable _____

If your y values are smaller than your x values, this means that k must be a

_____

or a _____

Practice Input/Output~ Using the given rules, find the missing x and y values.

1) y = 9x

x	0		3	5	8
y		18			

2) y = 12x

x	1		6		12
y		48		120	

3) y = 1.25x

x	0	2	4	6	8
y					

4) $y = \frac{2}{5}x$

x	0	4	9		20
y				4	

Practice Writing Rules~ Using the given values, determine the equations in terms of y = kx

5) Equation:_____

How do you know this equation works?

_____

_____

x	0	1	2	3	4
y	0	5	10	15	20

6) Equation: _____

How do you know this equation works?

_____

_____

x	0	9	12	21	27
y	0	3	4	7	9

---

1) Rhea is purchasing tickets to a One Direction concert. Tickets cost $35 apiece.

Since tickets cost $35, that is the _____, because this won't change.

X is the input (or independent variable), and this is the number of tickets purchased.

Y is the output (or dependent variable), and this is the total cost.

Since the constant is 35, the equation is _____

Rule: y = 35x

X (# tickets)	0	2	3		6
Y (total cost)				140	

2) Rocky is saving up for a new Tony Hawk game for his Wii. He earns $7.50 for each chore he does.

What is k, the constant? _____

X, the input, is the number of chores Rocky completes.

Y, the output, is the amount of money Rocky makes.

What is the equation? _____

Using this rule/equation, fill in the values in the table below.

X (# chores completed)		2		15	50
Y (total money earned)	0		75		

3) There are 37 boys in the drama club. They want to buy new props, so they are all going to pitch in money. They all want to pitch in the same amount.

K, the constant, is 37. This number is not going to change.

The amount that each boy brings in is the input, or the _____ value.

The total amount raised is the output, or the _____ value.

What is the equation? _____

Using this rule/equation, fill in the values in the table below.

X (amount each boy brings)	0	3	5	8.50	
Y (total amount raised)					370

4) Notice that direct variation ALWAYS uses the formula y = kx.

Therefore, when x = 0, y ALWAYS equals _____!