Name: _____   Date:_____

Algebra Section 1.4

Pages 21-26

Goals: "I will translate verbal sentences into equations or inequalities"

"I will decide if a given value is a solution to an equation or inequality"

Vocabulary:

Inequality: An open sentence that contains one of these symbols

_____, _____, _____, _____.

Writing an equation or inequality

Math Verbs:

Let's look at some inequalities.

<u>Example</u>: $x > 6$

What do we know? x is greater than 6

Can x be exactly 6?   No. There is not a $\geq$ sign.

<u>Try These</u>:

a) $y < 12$

What do we know? y is _____12

Can y be exactly 12?

b) $b \geq 2$

What do we know? b is _____ 2

Can b be exactly 2?

<u>Try These:</u>

Write the equation or inequality. For each inequality give one value that will make the statement true. The first two have been done for you.

"A number *x* is 5"   <u>*x*=5</u>

"6 is more than a number *k*"   <u>6>*k*   *k* can be 2</u>

"A number *n* is at least 11"   _____

"A number *m* is fewer than 14"   _____

"23 is no more than the number *a*"   _____

<u>Try These:</u> These are a bit more challenging.

Write the equation or inequality. For each inequality give at least one value that will make the statement true.

Hint: Write the expression(s) first and then choose the correct sign.

"The difference between 12 and a number k **is** 8."   _____

"The quotient of a number p and 12 **is** 3."   _____

"The quotient of a number p and 12 **is at least** 3."   _____

"The sum of a number y and 15 **is at most** 5."   _____

"The product of 7 and a number q **is more than** 10."   _____

"The sum of a number and 12 **is less than** 18"   _____

"Your math grade (g) needs to be at least a 75" _____

"The building (b) needs to be at greater than 80 feet tall" _____

"Your height (h) needs to be at least 48 inches to get on the ride" _____

"The cat (c) should eat no more than 2 cups of food a day" _____

"You need to make (p) more than $120 to pay off your debt" _____

Solution (of an equation or inequality):

Determine if the number listed is a SOLUTION to the equation or inequality.

<u>Example 1:</u>

$$3 + 2x = 15 \quad \text{for} \quad x=3$$

Input the value $3 + 2 \cdot 3 = 15$ $x=3$

Simplify $3 + 6 = 15$ Always follow order of operations!!

$$9 = 15$$

Check   Does 9=15?   No! This **is not** a solution of the equation!

<u>Example 2:</u>

$$12 < 4x - 5 \quad \text{for} \quad x=7$$

Input the value $12 < 4 \cdot 7 - 5$ $x=7$

Simplify $12 < 28 - 5$ Always follow order of operations!!

$$12 < 23$$

Check   Is 12<23? Yes! This **is** a solution of the inequality.

<u>Try These:</u>

a)   8 – 2x = 2   x = 3

Input:

Simplify:

Yes or No?

c)   4 < 7 – q   q = 3

Yes or No?

b)   2z + 5 $\geq$ 12 z = 1

Input:

Simplify:

Yes or No?

d) $18 > 2x - 3$ $x{=}4$

Yes or No?

Check whether the given number is a solution:

(the number given comes after the semi-colon)

a) $9 - x = 4; 5$ ($x{=}5$)

b) $b + 5 < 15; 7$ ($b{=}7$)

Yes or No?

Yes or No?

Challenge:

Combining inequalities:

There will be two signs. Give at least one value that could be a solution of the inequality

<u>Example:</u>

A number *n* is greater than 5 and less than 13

Hint: Put the variable in the middle and the two numbers on either side. Then put in the signs.

$$5 < n < 13$$

<u>Try These:</u>

a) *x* is greater than 3 and less than 9

b) A number *y* is no less than 5 and no more than 13

c) A number *q* is at least 5 and less than 17

d) A number *g* is more than 5 and no less than 18

e) A number *n* is at least 1 and less than 2

f) A number *d* is at least 7 and at most 10

Word Problems:

a) The last time you and 3 friends went to a mountain bike park, you had a coupon for $10 off the total purchase. Your final total was $17 for 4 tickets (after the $10 was taken off).

How much was the bill before the $10 was taken off? _____

How much did each ticket cost? _____

b) A basketball player scored 351 points last year. She wants to beat her points from last year. If the player plays 18 games this year, will an average of 20 points per game be enough to beat least year's total?

How many points did she score last year? _____

How many points did she score this year? _____

Is that better than last year's total? _____

c) Tyler would like to make no less than $610 selling coffee mugs online. If he sells 28 mugs for $22 each, will he achieve his goal?

What is his goal? _____

How much did he make selling mugs online? _____

Is this more than his goal? _____