Warm Up! On Quizizz, accept the invite!

Otherwise, fill in the table below.   37330672

Write the word descriptions for
the inequalities below.

$x < 5$	$x > 5$	$x \leq 5$	$x \geq 5$
is less than	is greater than	is less than or equal to	is greater than or equal to
under	over	is at most	is no less than
Smaller than	bigger than	is no more than	is at least
		Limit	

Watch video

How do we divide fractions?

$$\frac{5}{6} \div \frac{2}{3}$$

flip

$$\frac{5}{6} \cdot \frac{3}{2}$$

Keep   Flip
  change

multiply by
reciprocal

Solving Inequalities with Fractions

To undo multiplication by a fraction

"divide" by the fraction,

Which is really multipling by the reciprocal
(multiply by the flipped fraction)

$$-\frac{3}{2}\left(-\frac{2x}{3}\right) > \left(\frac{9}{1}\right)\left(-\frac{3}{2}\right) \qquad \frac{2}{1}(-36) < \left(\frac{1p}{2}\right)\left(\frac{2}{1}\right)$$

Flip sign $x < -\frac{27}{2}$ $-72 < P$

$x < -13.5$ rewrite
$P > -72$

smaller   bigger

−14 −13.5 −13 −12   −73 −72 −71

6-1/2/3
Solving Multi-Step Inequalities

Your Name

Mrs. T

11/20/18

Notes

Objective: To be able to solve multi-step inequalities using addition, subtraction, multiplication, or division of constants. To be able to graph inequality solutions found. To understand what the solutions are.

Virtue/Skill: When we graph inequalities we might need to solve for a variable in order to graph it. With two variables on a coordinate plane, we need to be able to check our solutions to understand how to shade. Graphing on a number line is similar to graphing on a coordinate plane.

Graphing Inequalities

Shade in Solutions "arrow

Rember:

< **open circle** on number line, <u>limit</u> is not a solution

↑ Starting value

>

--->

≤ **closed circle** on the number line, limit is a solution

≥

Solving by Adding or Subtracting Inequalities
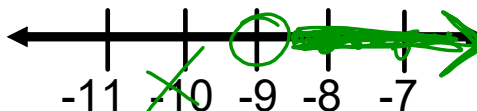
To solve: pretend like it is an = sign

- undo addition with subtraction
- undo subtraction with addition

$k + 5 > -4$

$-5 \quad -5$

$k > -9$

starting value

goes in middle

is -9 a solution? No open circle

-11 -10 -9 -8 -7

Solving by Multiplying and Dividing Inequalities

To solve: pretend like it is an = sign
- undo multiplication with division
- undo division with multiplication

✱One Catch...

if you have to multiply or divide by a negative number on both sides to isolate the variable....you must flip the inequality sign

FLIP

$-6 \cdot \left(-\dfrac{x}{6} \right) > (2) \cdot -6$

$x < -12$

-6 is negative

$-12 > x$

DON'T FLIP

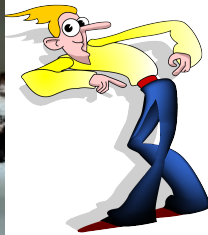$\dfrac{7x}{7} < \dfrac{-42}{7}$ *7 is not negative*

$x < -6$

$\{x \mid x < -12\}$

$\{x \mid x < -6\}$

Let's Put it all together!

Let me see you Mul-ti-Step!!!

Work them just as you did multi-step equations.

$6x - 21 > 9$

$+21 \quad +21$

$\dfrac{6x}{6} > \dfrac{30}{6}$

Positive
Not
flipped

$\boxed{x > 5}$

$c - 3 \le 3c + 7$

$-3 \le 3(c+7)$

$-3 \le 3c + 21$

$-21 \qquad\qquad -21$

$\dfrac{-24}{3} \le \dfrac{3c}{3}$

$-8 \le c$

rewrite

$c \ge -8$

$3(y + 3) < -42y$

$$3y + 9 < -42y$$
$$-3y \qquad -3y$$

$$9 < -45y$$
$$\frac{9}{-45} < \frac{-45y}{-45} \quad \text{flip!}$$

$$-\frac{1}{5} > y$$

$$y < -\frac{1}{5} \quad \text{rewrite}$$

$-\frac{1}{5}$

$\underline{6k} + \underline{k} + 14 \leq 35$

$$7k + 14 \leq 35$$
$$-14 \quad -14$$

$$7k \leq 21$$
$$\frac{7k}{7} \leq \frac{21}{7}$$

$$k \leq 3$$

2   3   4

Writing Inequalities

Ask yourself: Can it be more? Can it be equal?

<	>	$\leq$	$\geq$
is less than	is greater than	is at most	is at least
		is less than or equal to	is greater than or equal to
		is no more than	is no less than

The sum of a number and 17 is no less than 26.
$$+ \qquad x \quad + 17 \qquad \geq \qquad 26$$
$$(x + 17) \geq 26$$

A number divided by fifteen is greater than or equal to sixty.
$$x \qquad \div \qquad 15 \qquad \geq \qquad 60$$
$$\frac{x}{15} \geq 60$$

4 less than Twice a number is less than three times the number
$$-4 \quad 2x \qquad \qquad 3$$
$$x$$
$$2x - 4 < 3x$$

not the inequality sign word b/c no: is

A number multiplied by negative two is negative. "so less than"
$$x \qquad \cdot \quad -2 \qquad \qquad 0$$
$$-2x < 0$$

Twelve is at most a number decreased by 7
$$12 \quad \leq \qquad x \qquad -7$$
$$12 \leq x - 7$$

-2(7 - .5c) + 8 < 14 - 3c   0.5x - 2.4 ≤ 2.1 + 3.5x

$-14 + k + 8 < 14 - 3k$

$-6 + k < 14 - 3k$

$+6 \qquad +6$

$k < 20 - 3k$

$+3k \qquad\qquad +3k$

$\dfrac{4k}{4} < \dfrac{20}{4}$

$k < 5$

$\{k \mid -2(7-c)+8 < 12-3k ; k < 5\}$

$-.5x \qquad\qquad -.5x$

$-2.4 \le 2.1 + 3x$

$-2.1 \quad -2.1$

$\dfrac{-4.5}{3} \le \dfrac{3x}{3}$

$-1.5 \le x$

$\{x \mid .5x - 2.4 \le 2.1 + 3.5x ; x \ge -1.5\}$

-1.5

Summary

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Assignment:

From Textbook:

pg. 71 #9,10,17,18

pg. 77 #7-15 odd