Your Name

Mrs. T

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Notes

2.3 Solving Inequalities by Multiplication and Division

Objective: To be able to solve inequalities using multiplying and dividing. To be able to graph inequality solutions found. To understand what the solutions are.

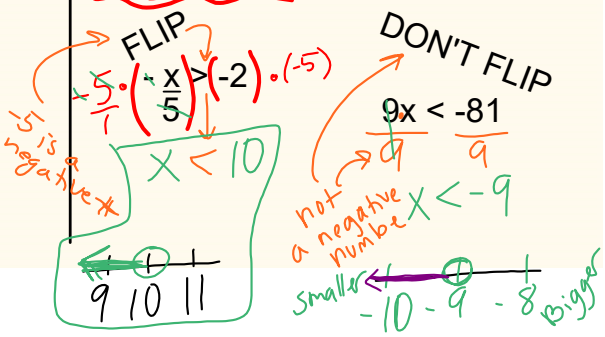
Virtue/Skill: When we graph inequalities we might need to solve for a variable in order to graph it. With two variables on a coordinate plane, we need to be able to check our solutions to understand how to shade. Graphing on a number line is similar to graphing on a coordinate plane.

Solving Multiplication/ Division Inequalities

To solve: pretend like it is an = sign and do what you have always done

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.



$3 \cdot 4 = 3$ groups of 4
$4 + 4 + 4$

$3x = x + x + x$
$3 \cdot x$

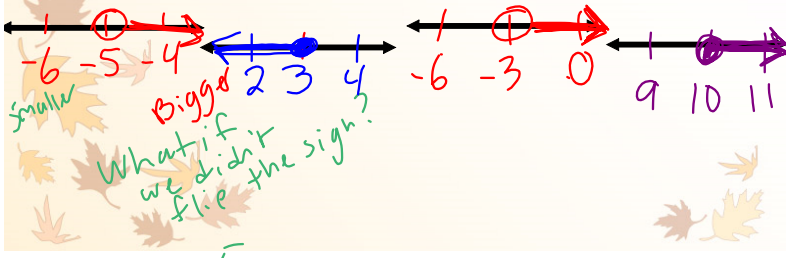
Solve and Graph

Yes Flip
$-3y < 15$
$\frac{-3y}{-3} < \frac{15}{-3}$ flip
this is a negative #
$y > -5$

No flip
$7m \leq 21$
$\frac{7m}{7} \leq \frac{21}{7}$
7 is a positive #
$m \leq 3$

Flip
$-z < 3$
$\frac{-z}{-1} > \frac{3}{-1}$
this is a positive #
$z > -3$

No Flip
$\frac{t}{5} \geq 2$
$\cdot 5 \quad \cdot 5$
$t \geq 10$



$y < -5$
check -6
$-3y < 15$
$-3(-6) < 15$
$18 < 15$
not true

Homework Key: Textbook pg. 71

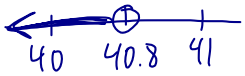
3,4,7,8,11,12,15,16

3. $x \leq 2$

4. $y \leq -3$

7. $x > -4$

8. $a < 40.8$



11. $t > -2$

12. $y < -1$

15. $n \leq -3$

16. $w \geq -80$

If the variable is on the right

Rewrite it (before you start or at the end) keeping the expression on the bigger end still on the bigger end.

Rewrite before you begin

$40 \geq -4x$

$\frac{-4x}{-4} \leq \frac{40}{-4}$

$x \geq -10$

Flip sign b/c you divided by a negative number!

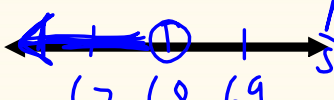
$(-2)(-34) < \left(\frac{p}{-2}\right)(-2)$

$68 > p$

Flip sign b/c you multiplied by a negative number

$p < 68$

Rewrite so variable is on left at the end



How do we divide fractions?

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

Skip Flip

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

multiply

Solving Inequalities with Fractions

To "divide" by the fraction, multiply by the reciprocal (multiply by the flipped fraction)

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

Flip sign

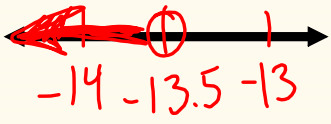
$$x < \frac{-27}{2}$$

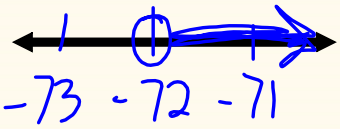
$$x < -13.5$$

No flip b/c rewrite

$$-72 < p$$

$$p > -72$$





Write Multiplication and Division Inequalities

A number divided by fifteen is greater than or equal to sixty.

$\frac{x}{15} \geq 60$

A number multiplied by negative two thirds is less than zero.

$-\frac{2}{3}x < 0$