Math 9 – Unit 3: Solving Equations

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Lesson #5: Solving Inequalities

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An equation utilizes the equal (=) sign, and when you solve an equation, you get one answer. An inequality uses the greater or less then symbols ($<, >, \leq, \geq$), and when solving an inequality, we get infinite answers! The math of solving an inequality is THE SAME as solving an equation except for one stipulation (which we will get to in the third example). In order to represent the infinite answers, you need to graph the solution on a number line.

Solve each inequality, then graph the solution on a number line.

a) $\frac{7p}{7} \geq \frac{56}{7}$

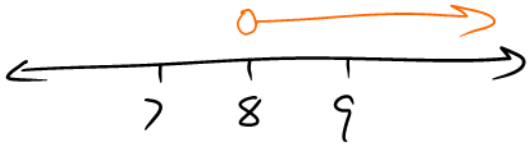
$p \geq 8$

Test: $7(10) > 56$

$70 > 56$ Yes!

$7(8) > 56$

$56 > 56$ NO!

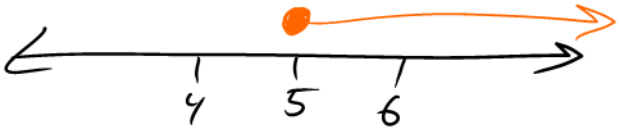


> or < use O

≥ or ≤ use ●

b) $-5 \leq k - 10$ (+10 +10)

$5 \leq K$

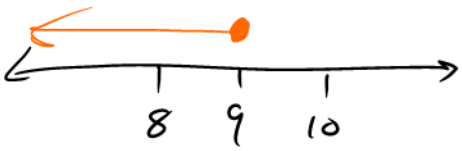


"K is greater or equal to 5"

BIG NOTE: When you multiply or divide an inequality by a negative, you need to switch (turn around) the inequality sign.

c) $\frac{-45}{-5} \leq \frac{-5y}{-5}$

$9 \geq y$



Let's say we don't flip

$9 \leq y$ plug in 10:

$-45 \leq -5(10)$

$-45 \leq -50$

FALSE

∴ switch the symbol!

d) $16 > 9 + \frac{m}{2}$ (−9 −9)

$2(7) > \left(\frac{m}{2}\right)2$

$14 > m$

"m less than 14"

Left Right

Move the variables to the side with the biggest variable.

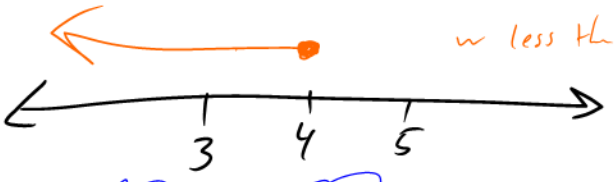
e) $7(w+6) \geq 38+8w$

$7w+42 \geq 38+8w$

$4 \geq w$

4 greater than or equal to w

w less than or equal to 4



$7w+42 \geq 38+8w$

$-1w \geq -4$

$w \leq 4$

f) $5(n-6)+8 \leq -2(5-4n)-4n$

$5n-30+8 \leq -10+8n-4n$

$5n-22 \leq -10+4n$

$n \leq 12$

n less than or equal to 12

g) $\frac{651}{25} < \frac{39}{10} + \frac{27n}{10}$

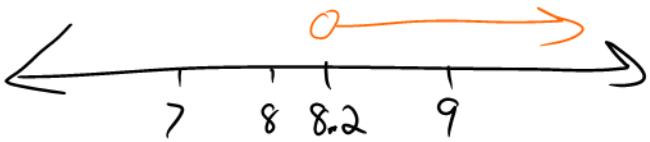
$\frac{1302}{50} < \frac{195}{50} + \frac{135n}{50}$

$1302 < 195 + 135n$

$1107 < 135n$

$8.2 < n$

n greater than 8.2



h) $\frac{3y+5}{3} - \frac{y-3}{6} \leq -2$ C.D. = 6

$\frac{2(3y+5)}{6} - \frac{(y-3)}{6} \leq \frac{-12}{6}$

$6y+10-y+3 \leq -12$

$5y+13 \leq -12$

$5y \leq -25$

$y \leq -5$

y less or equal to -5