

Math 9 – Unit 3: Solving Equations

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Lesson #5: Solving Inequalities

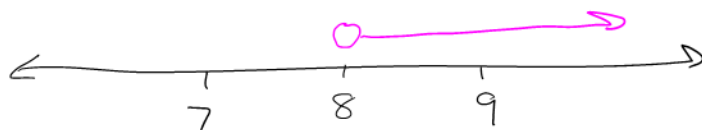
Learning Goal: We are learning to solve inequalities.

An equation utilizes the equal (=) sign, and when you solve an equation, you get one answer. An inequality uses the greater or less than symbols (<, >, ≤, ≥), 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) $7p \geq 56$ $>$ or $<$ use \bigcirc

$p \geq 8$
greater than



b) $-5 \leq k - 10$

$5 \leq k$

$k \geq 5$

\geq \leq use \bullet

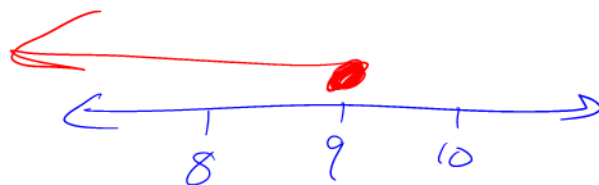


BIG NOTE: When you multiply or divide an inequality by a negative, you need to flip the inequality sign.

c) $-45 \leq -5y$

$9 \geq y$

$-45 \leq -5y$
 $5y \leq 45$
 $y \leq 9$



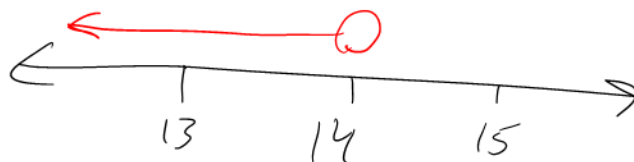
$$d) 16 > 9 + \frac{m}{2}$$

$$(2) 7 > \frac{m}{2} \quad (2)$$

$$14 > m$$

or

$$m < 14$$



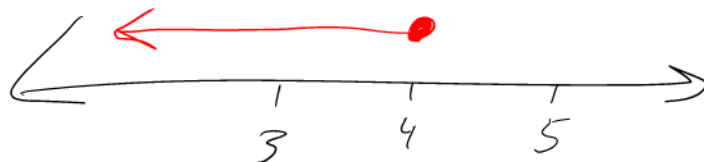
$$e) 7(w+6) \geq 38 + 8w$$

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

$$4 \geq w$$

or

$$w \leq 4$$

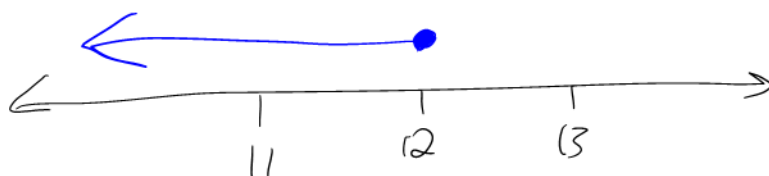


$$f) 5(n-6) + 8 \leq -2(5-4n) - 4n$$

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

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

$$n \leq 12$$



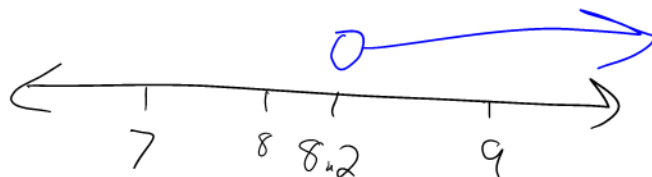
$$g) \left(\frac{651}{25} < \frac{39}{10} + \frac{27n}{10} \right) \quad 50$$

$$2(651) < 5(39) + 5(27n)$$

$$1302 < 195 + 135n$$

$$\frac{1107}{135} < \frac{135n}{135}$$

$$8.2 < n$$



$$h) \left(\frac{3y+5}{3} - \frac{y-3}{6} \leq -2 \right) \quad 6$$

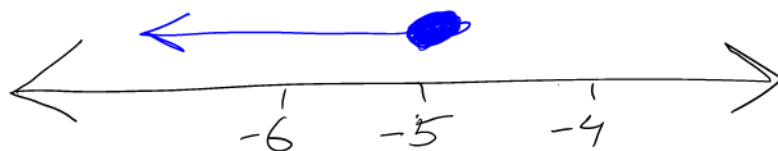
$$2(3y+5) - 1(y-3) \leq -12$$

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

$$5y + 13 \leq -12$$

$$\frac{5y}{5} \leq \frac{-25}{5}$$

$$y \leq -5$$



Success Criteria:

- I can graph an inequality on a number line
- I can recognize what to do to an inequality when it is multiplied/divided by a negative
- I can recognize that solving an inequality follows the same rules as solving an equation