

Solving Inequalities

Homework - Handout #s 1acegi, 2aceg, 3aceg, 4ac

Nov 4-10:26 AM

Warm Up:
Determine the type of function.

$$y = \sqrt{x+2} + 4$$

Root

$$x^2 + y^2 = r^2$$

Circle

$$y = \frac{3}{x} - 5$$

Reciprocal (Rational)

$$y = -3(x+1)^3 - 5$$

Cubic

$$y = 3|x+5| - 4$$

Absolute value



Mar 19-7:45 AM

Inequality Symbols

$x \leq y$ x is less than or equal to y

$x < y$ x is less than y

$x \geq y$ x is greater than or equal to y

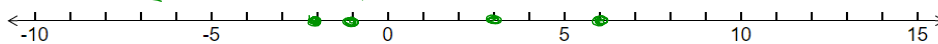
$x > y$ x is greater than y



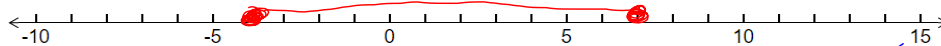
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Graphing on a Number Line

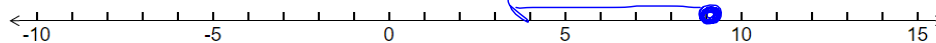
To indicate specific points as part of a set we draw points. $(-2, -1, 3, 6)$



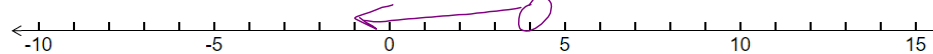
If it is a continuous group of numbers (where everything in between is included) we draw a line on the number line. $-4 \leq x \leq 7$



To indicate less than or equal to use a coloured in circle $x \leq 9$



To indicate less than use an open circle $x < 4$



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Set Notation

Set notation is a way to describe a group of numbers.

We use:

- "curly" brackets to indicate set notation - { }
- the | symbol in set notation means "such that"
- the \in means "element of"
- the \mathbb{R} means the set of Real Numbers

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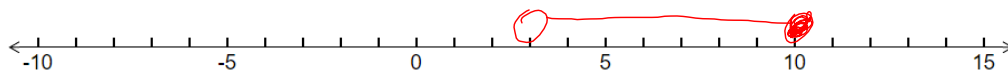
Example

Graph on a number line.

a) $\{2, 4, 6, 8, 10\}$



b) $\{x \in \mathbb{R} \mid 3 < x \leq 10\}$



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Solving Inequalities

Same rules as solving equations.

Only difference is multiplying or dividing by a negative

- when we multiply or divide by a negative we have to switch the direction of the inequality.

Why?

$$\begin{array}{l}
 -3 < 4 \quad \text{True} \\
 6 < -8 \quad \text{False} \\
 \Rightarrow 6 > -8 \quad \text{True again}
 \end{array}$$

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Solve the inequality and graph the solution on a number line

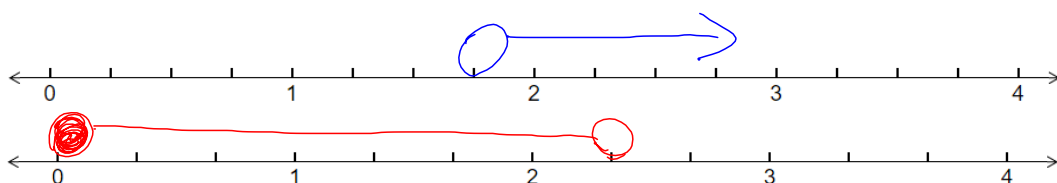
$$4x - 2 > 5$$

$$\frac{4x}{4} > \frac{7}{4}$$

$$x > \frac{7}{4}$$

$$1 \leq 3x + 1 < 8$$

$$\begin{array}{l}
 1 \leq 3x + 1 \quad 3x + 1 < 8 \\
 0 \leq \frac{3x}{3} \quad \frac{3x}{3} < \frac{7}{3} \\
 0 \leq x \quad x < \frac{7}{3}
 \end{array}$$



Jan 20-13:37

Homework



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