

Eye Opener

Solve each equation:

$$y - 5 = 6$$

$$y = 11$$

$$p - 4 = -6$$

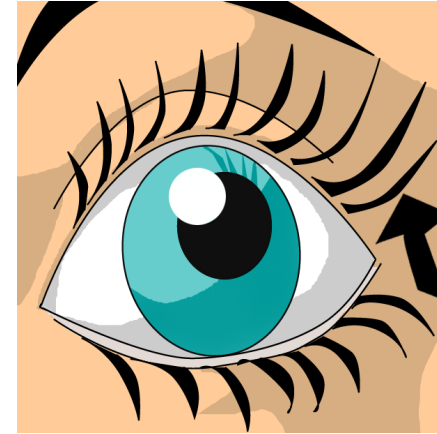
$$p = -2$$

$$v + 5 = -6$$

$$v = -11$$

$$k + \frac{2}{3} = \frac{5}{9}$$

$$k = -\frac{1}{9}$$





3-2: Solving Inequalities Using Addition and Subtraction

Essential Understanding:

We apply the addition and subtraction properties of inequality to solve inequalities in exactly the same way we applied the addition and subtraction properties of equality to solve equations.

Addition & Subtraction Properties of Inequality

If $a > b$ then $a + c > b + c$

If $a < b$ then $a + c < b + c$

If $a > b$ then $a - c > b - c$

If $a < b$ then $a - c < b - c$



Do the addition and subtraction properties of inequality apply for all Real Numbers a , b , & c regardless of sign value?



Since $6 > 3$ the addition property of inequality holds that $6 + 4 > 3 + 4$?

Agree or disagree?

$$10 > 7$$

Since $3 < 12$ the subtraction property of inequality holds that $3 - 3/2 < 12 - 3/2$

Agree or disagree?

$$1\frac{1}{2} < 10\frac{1}{2}$$

Since $-4 < 3$ the addition property of inequality holds that $-4 + -3/5 < 3 + -3/5$

Agree or disagree?

$$-4\frac{3}{5} < 2\frac{2}{5}$$

Since $15 < 25$ the subtraction property of inequality holds that $15 - -5 < 25 - -5$

Agree or disagree?

$$15 + 5 < 25 + 5$$
$$20 < 30$$

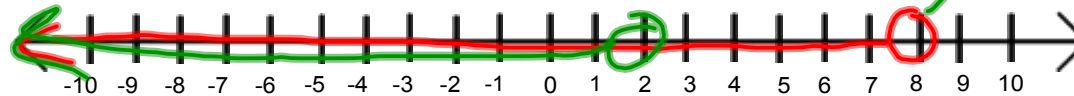
Using the Addition Property of Inequality

1. Solve $x - 3 < 5$ and graph the solution.

- Distribute (N/A) & Simplify (N/A)
- Isolate Variables & Constants
- Divide both sides by the coefficient (N/A)
- Graph the solution
- Check your answer (Requires two checks - the endpoint and one other value on shaded region)

$$x - 3 < 5$$

$$\begin{array}{r} 13 \quad 13 \\ x < 8 \end{array}$$



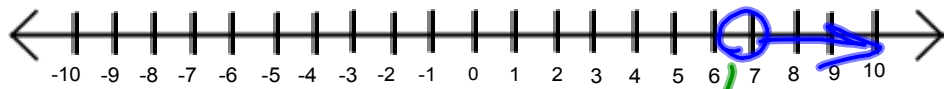
2. Solve $2 < x - 5$ and graph the solution.

- a. Distribute (N/A) & Simplify (N/A)
- b. Isolate Variables & Constants
- c. Divide both sides by the coefficient (N/A)
- d. Graph the solution

$$2 < x - 5$$

$$+5 \quad +5$$

$$7 < x = x > ?$$



- e. Check your answer (Requires two checks - the endpoint and one other value on shaded region)

$$\begin{aligned} &\geq \text{●} \\ &\leq \text{●} \\ &> \text{○} \\ &< \text{○} \end{aligned}$$

$$a - 5$$

$$2 < 4$$

$$2 = 7 - 5$$

$$2 = 2$$

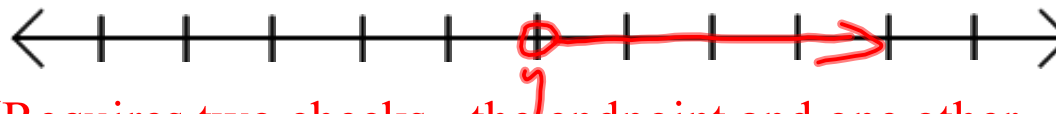
✓ endpoint
equality

4. Solve $7 < x + 3$ and graph the solution.

- Distribute (N/A) & Simplify (N/A)
- Isolate Variables & Constants
- Divide both sides by the coefficient (N/A)
- Graph the solution

$$\begin{array}{r} 7 < x + 3 \\ -3 \quad -3 \\ \hline 4 < x \\ x > 4 \end{array}$$

- Check your answer (Requires two checks - the endpoint and one other value on shaded region)



$$\begin{array}{r} 4 + 3 = 7 \\ -3 \quad -3 \\ \hline 4 = 4 \end{array}$$

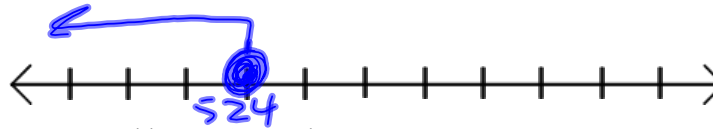
Writing and Solving an Inequality
Word Problems Involving "Inequalities" are set-up and Solved
the Same Way "Equation" Word Problems are!

5. The maximum load of a chairlift is 680 lbs. The weight of the person on the lift is 124 lbs. and the weight of his bike is 32 lbs. How much additional weight can the chairlift safely carry?

- a. Define variable (and any other variable terms needed) $x = \text{additional lb.}$
- b. Draw a diagram or chart with relevant formulas (N/A)
- c. Write the inequality

d. Solve the inequality

e. Graph your solution



- f. Check your answer for accuracy, reasonableness, & completeness
 (Requires two checks for accuracy- the endpoint and one other value on shaded region)

$$\begin{array}{r}
 680 > (124 + 32) + x \\
 680 = 156 + x \\
 \underline{-156} \quad \underline{-156} \\
 524 \geq x
 \end{array}$$



6. The hard drive on your computer has a capacity of 250 GB. You use 115 GB and want to save some home videos on your hard drive. What are the possible sizes of the home video collection you can save?

a. Define variable (and any other variable terms needed)

b. Draw a diagram or chart with relevant formulas (N/A)

c. Write the inequality

d. Solve the inequality

e. Graph your solution

f. Check your answer for accuracy, reasonableness, & completeness

(Requires two checks for accuracy- the endpoint and one other value on shaded region)

