

$$V = \frac{\pi}{3} r^2 h$$

$$h =$$

$$\frac{3}{\pi r^2} (V) = \left(\frac{\pi r^2 h}{3} \right) \frac{3}{\pi r^2}$$

$$h = \frac{3V}{\pi r^2}$$

$$1.) \quad \frac{S}{L} = \frac{L^* (1-r)}{L}$$

$$r =$$

$$-\frac{S}{L} + 1 = r$$

$$\frac{S}{L} = 1 - r$$

$$-1 \left(\frac{S}{L} - 1 \right) = -1(-r)$$

$$2.) \quad S = 2L\boxed{W} + 2H\boxed{W} + 2LH \quad W =$$

$$S - 2LH = 2LW + 2HW$$

$\xleftarrow{-2LH} \quad \downarrow \quad \downarrow$

$$\frac{S - 2LH}{2L + 2H} = \frac{W(2L + 2H)}{2L + 2H}$$

$$\boxed{W = \frac{S - 2LH}{2L + 2H}}$$

$$3.) \quad t \left(\frac{X+3}{t} \right) = (t^2) t$$

$$X+3 = t^3$$

$\quad -3 \quad \quad -3$

$$\boxed{X = t^3 - 3}$$

1.) Get all non-"w" terms on the opposite side of the equal sign.

2.) Factor out W. (anti-distribute)

3.) Divide both sides by factored out quantity.

$$X = \frac{X+3}{t} \times \frac{t^2}{1}$$

$$t^3 = X+3$$

$\quad -3 \quad \quad -3$

side bar

$$X=5 \quad t=2$$

$$\frac{5+3}{2} = 2^2 \quad \frac{5+3}{2} = 2^2$$

$$\frac{8}{2} = 2^2 \quad \frac{5}{2} = 2^2 - 3$$

$$4 = 2^2 \quad \frac{5}{2} = 1$$

$$4.) a(x+c) = b(x-c) \quad X =$$

$$\textcircled{+} ax + ac = bx - bc$$

$\textcircled{\text{non-x}}$

$$\quad -ac \quad \quad -ac$$

$$ax = bx - bc - ac$$

$$\quad -bx \quad -bx$$

$$\underline{ax} - \underline{bx} = -bc - ac$$

$$X = \frac{-bc - ac}{a - b}$$

$$\frac{x(a-b)}{a-b} = \frac{-bc - ac}{a-b}$$

$$1.) 7 + 13(x+1) \leq 3x$$

Think:

$$7 + 13(x+1) = 3x$$

$$7 + 13x + 13 \leq 3x$$

$$13x + 20 \leq 3x$$

$$\quad -13x \quad \quad -13x$$



$$\frac{20}{-10} \leq \frac{-10x}{-10}$$

$$\quad \quad \quad \downarrow$$

$$-2 \geq x$$

divide by a negative → flip inequality!

closed

$$x = 100$$

$$-2 \geq 100 \text{ false!}$$

$$-5 - 8(8 + 7n) > -181$$

$$-5 - 64 - 56n > -181$$

$$-69 - 56n > -181$$

$$+69$$

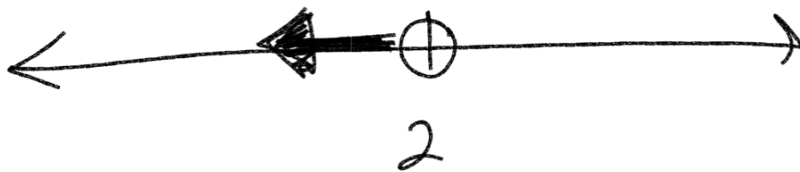
$$+69$$

$$\frac{-56n}{-56} > \frac{-112}{-56}$$

$$n < 2$$

Negative \rightarrow opposite

When you mult or divide by a negative, we must flip the inequality



Compound Inequalities

$$\frac{9x}{9} < \frac{54}{9}$$

$$x < 6$$

and

$$\frac{-4x}{-4} < \frac{12}{-4}$$

$$x > -3$$

converge

flip

$$\begin{matrix} > < \\ 0 \\ \geq \leq \\ \bullet \end{matrix}$$



$$\frac{16x}{16} \leq \frac{32}{16}$$

$$x \leq 2$$

or

$$\frac{-5x}{-5} < \frac{-40}{-5}$$

$$x > 8$$

divergent



"and" lines crash together

"or" lines go apart (never touch)

Never... ever... Won't go in the same direction.

Focus in middle



$$14 > 3x - 1 \geq -10$$

+1 +1 +1

$$14 > 3x - 1$$

$$3x - 1 \geq -10$$

$$\frac{15}{3} > \frac{3x}{3} \geq \frac{-9}{3}$$

$$5 > x \text{ and } x \geq -3$$

↑ convergent

$$5 > x \geq -3$$



