M-AZ Algebra 2 Week 4 10/2

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

what if...

$\frac{4}{3}(V) = \left(\frac{3}{4} h\right)\frac{4}{3}$

multiply by the inverse

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

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

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

multiply by inverse

1.) $S = L(1-r)$ $\quad \boxed{r} =$

$S = L - rL$

$-L \quad -L$

$\frac{S-L}{-L} = \frac{-rL}{-L}$

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

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

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

$-1 \quad -1$

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

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

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

2.) $S = LW + WH + LH \quad W = ?$

$-LH \qquad\qquad -LH$

$S - LH = LW + WH$

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

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

3.) $\frac{x+3}{t} = \frac{t^2}{4} \qquad x =$

$t \cdot t^2 = t^{1+2}$

$t \cdot t \cdot t = t^3$

$\frac{4(x+3)}{4} = \frac{t^3}{4}$

$x + 3 = \frac{t^3}{4} - 3$

$-3 \qquad -3$

$$\boxed{x = \frac{t^3}{4} - 3 \quad \text{or} \quad \frac{t^3 - 12}{4}}$$

4.) $a(x+c) = b(x-c) \qquad x = ?$

$ax + ac = bx - bc$

$-ac \qquad -ac$

$ax = bx - ac - bc$

$-bx \qquad -bx$

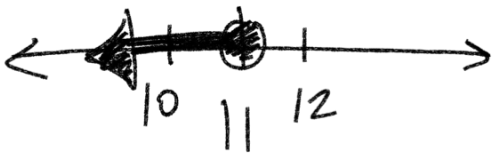
$ax - bx = -ac - bc$

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

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

Solve Inequalities

$$2t + 28 \leq 50$$
$$-28 \quad -28$$



$$\frac{2t}{2} \leq \frac{22}{2}$$

$$t \leq 11$$

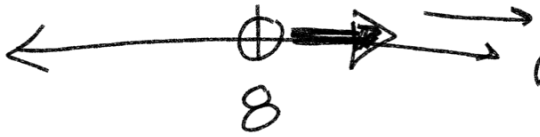
$10 \leq 11$ ✓ $\quad$ ~~$12 \leq 11$~~

$>$ $<$ $\bigcirc$

$\geq$ $\leq$ ●

$$2(m+3) + 1 > 23$$
$$-1 \quad -1$$

$$\frac{2(m+3)}{2} > \frac{22}{2}$$



BILLION

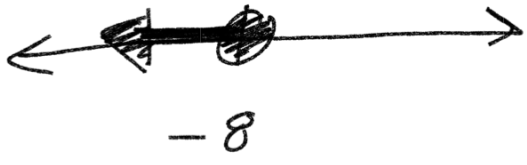
$$m + 3 > 11$$
$$-3 \quad -3$$

$$m > 8$$

$$\frac{5(1-2m)}{5} \geq \frac{85}{5}$$

$m \leq -8$

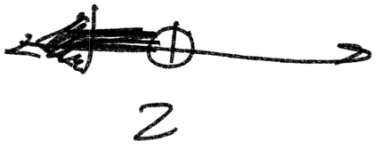
$$1-2m \geq 17$$
$$-1 \qquad -1$$
$$-2m \geq 16$$
$$\frac{-2m}{-2} \geq \frac{16}{-2}$$
$$m \leq -8$$



Whenever you multiply or divide by a negative, flip inequality

$$-5 - 8(8+7n) > -|8|$$
$$+5 \qquad\qquad +5$$
$$-8(8+7n) > -176$$
$$\frac{-8(8+7n)}{-8} > \frac{-176}{-8} \quad \text{flip!}$$
$$8+7n < 22$$
$$-8 \qquad -8$$
$$7n < 14$$
$$\frac{7n}{7} < \frac{14}{7}$$

$n < 2$

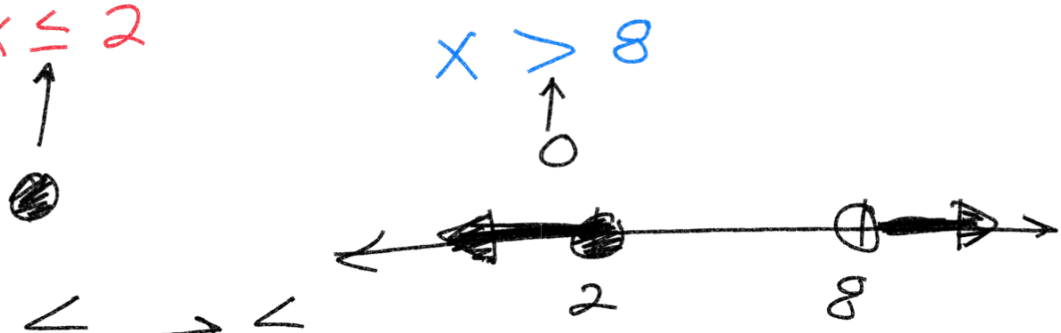


Compound Inequalities

$16x \leq 32$ or $-5x < -40$ → Divergent

$\frac{16x}{16} \leq \frac{32}{16}$ $\quad$ $\frac{-5x}{-5} < \frac{-40}{-5}$

$x \leq 2$ $\quad$ $x > 8$



$\leq \rightarrow \leq$

convergent

$9x < 54$ and $-4x < 12$

$\frac{9x}{9} < \frac{54}{9}$ $\quad$ $\frac{-4x}{-4} < \frac{12}{-4}$

$x < 6$ $\quad$ $x > -3$

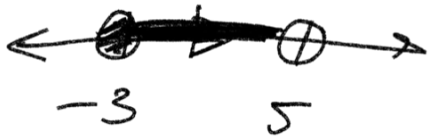
$14 > 3x - 1 \geq -10$

$+1$ $\quad$ $+1$ $\quad$ $+1$

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

$5 > x \geq -3$

$5 > x \geq -3$

$5 > x$ $\quad$ $x \geq -3$

$x < 5$