

W-A1 Algebra 1 Week 17 1/17

$$1.) \quad |x| - 3 = 12$$

+3 +3

$$|x| = 15$$

⊕ → X = 15 ⊖ → X = -15

$$2.) \quad -4|x| = 28$$

-4 -4

$$|x| = -7$$

No solution

$$3.) \quad |x - 8| = 15$$

1.) Isolate absolute value
2.) Negative check

$$x - 8 = 15$$

+8 +8

X = 23

$$x - 8 = -15$$

+8 +8

X = -7

$$4.) \quad |x + 3| + 7 = 20$$

-7 -7

$$|x + 3| = 13$$

⊕

$$x + 3 = 13$$

-3 -3

X = 10

$$x + 3 = -13$$

-3 -3

X = -16

$$|x + 3| = 13$$

X = 10

$$|10 + 3| = 13$$

$$|13| = 13 \checkmark$$

$$|x + 3| = 13$$

X = -16

$$|-16 + 3| = 13$$

$$|-13| = 13 \checkmark$$

$$1.) \cancel{x} \left(\frac{|x|}{\cancel{-2}} \right) = (-8)(-2)$$

$$2.) |x| + 9 = 7$$

$\begin{matrix} -9 & -9 \end{matrix}$

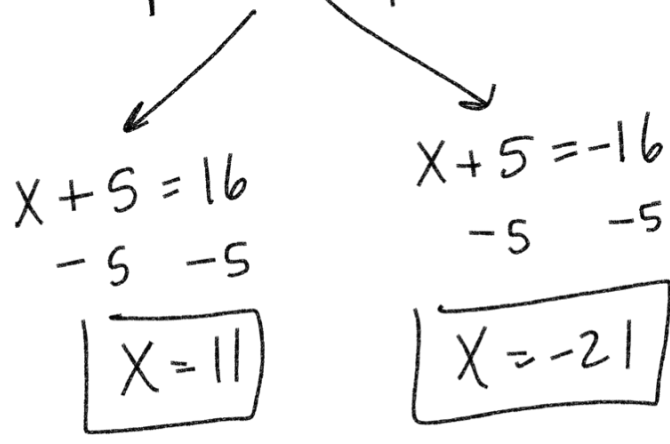
$$|x| = 16$$



$$|x| = -2$$

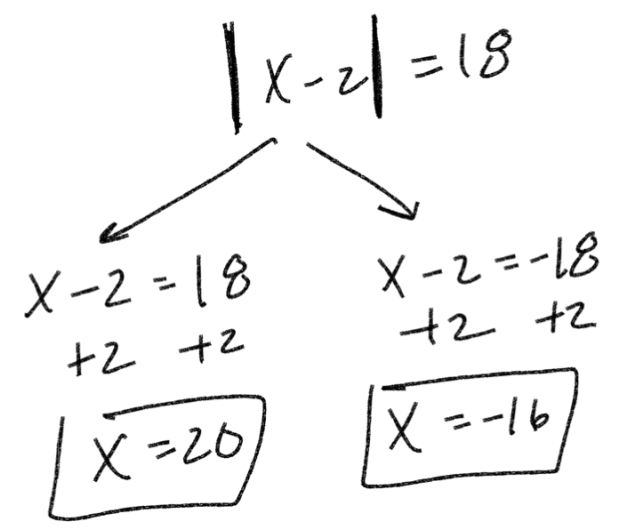
No solution

$$3.) |x + 5| = 16$$

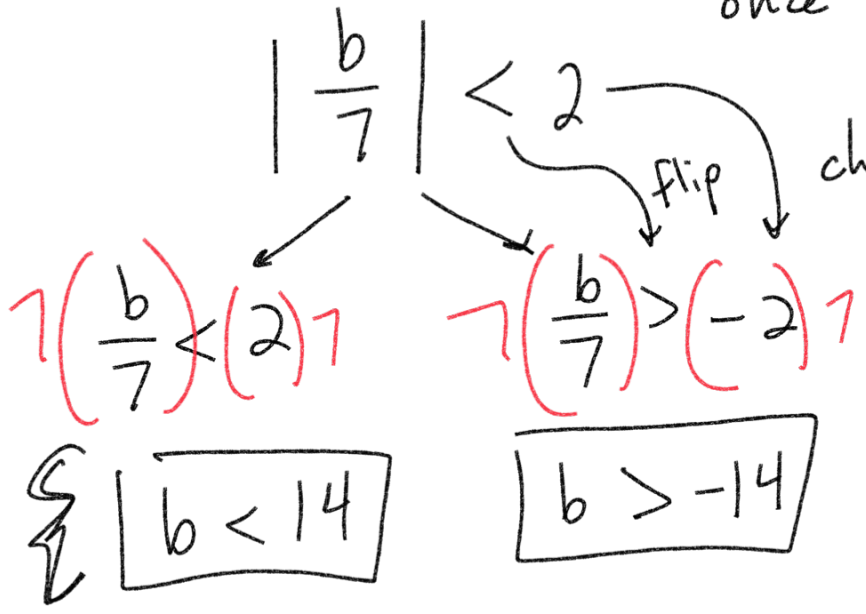


$$4.) |x - 2| - 6 = 12$$

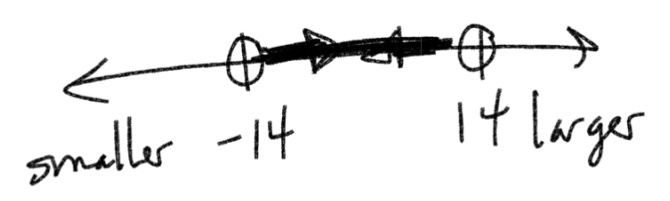
$\begin{matrix} +6 & +6 \end{matrix}$



once isolated...



opposites
 $2 \rightarrow -2$
 $< \rightarrow >$



$$|x - 6| < 4$$

$$x - 6 < 4$$

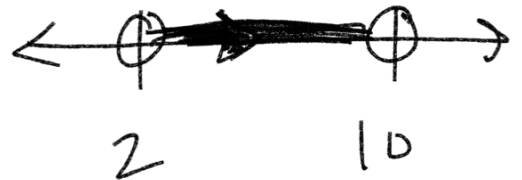
+6 +6

$$x < 10$$

$$x - 6 > -4$$

+6 +6

$$x > 2$$



$$|x - 2| > -3$$

Always!
all solutions

$$|x - 2| < -3$$

Never!
No solution

1.) $-4|x| > 3$

-4 -4

$$|x| < -\frac{3}{4}$$

No solution

flip inequality whenever you multiply or divide by a negative.

2.) $-4|x| \leq -8$

-4 -4

$$|x| \geq 2$$

change sign
and
flip inequality

$$x \geq 2$$

$$x \leq -2$$



$$3.) \quad |4 + 9x| \leq 5$$

$$4 + 9x \leq 5$$

$$\begin{array}{r} -4 \\ -4 \end{array}$$

$$\frac{9x}{9} \leq \frac{1}{9}$$

$$\boxed{x \leq \frac{1}{9}}$$

$$4 + 9x \geq -5$$

$$\begin{array}{r} -4 \\ -4 \end{array}$$

$$\frac{9x}{9} \geq \frac{-9}{9}$$

$$\boxed{x \geq -1}$$



$$2 - 5|10x + 2| \geq -108$$

$$\begin{array}{r} -2 \\ -2 \end{array}$$

$$\frac{-5|10x + 2|}{-5} \geq \frac{-110}{-5}$$

$$|10x + 2| \leq 22$$

$$10x + 2 \leq 22$$

$$\begin{array}{r} -2 \\ -2 \end{array}$$

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

$$\boxed{x \leq 2}$$

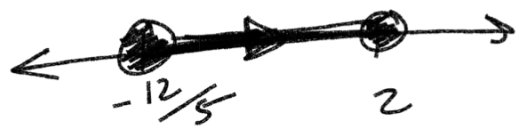
$$10x + 2 \geq -22$$

$$\begin{array}{r} -2 \\ -2 \end{array}$$

$$\frac{10x}{10} \geq \frac{-24}{10}$$

$$\boxed{x \geq \frac{-12}{5}}$$

You must flip the inequality when you mult or divide by a negative!



$$2 \left| \frac{x}{4} - 3 \right| - 8 < 12 \quad \left| \quad \right. \quad 2x - 8 < 12$$

+8 +8

$$\frac{2 \left| \frac{x}{4} - 3 \right|}{2} < \frac{20}{2}$$

$$2 \left| \frac{x}{4} - 3 \right| - 8 < 12$$

$$\left| \frac{x}{4} - 3 \right| < 10$$

$$\frac{x}{4} - 3 < 10$$

+3 +3

$$\frac{x}{4} - 3 > -10$$

+3 +3

$$\left(\frac{x}{4} \right) < (13)4$$

$$x < 52$$

$$4 \left(\frac{x}{4} \right) > (-7)4$$

$$x > -28$$

