W-A1 Algebra 1 1/19

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

$+3 \quad +3$

$|x| = 15$

$x = 15$ $\quad$ $x = -15$

2.) $\frac{-4|x|}{-4} = \frac{28}{-4}$

$|x| = -7$

no solution

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

$\oplus$ $\quad$ $\ominus$

$x - 8 = 15$ $\quad$ $x - 8 = -15$

$+8 \quad +8$ $\quad$ $+8 \quad +8$

$x = 23$ $\quad$ $x = -7$

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

$-7 \quad -7$

$|x + 3| = 13$

$x + 3 = 13$ $\quad$ $x + 3 = -13$

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

$x = 10$ $\quad$ $x = -16$

$\left|\frac{b}{7}\right| < 2$ =

take the negative and flip the inequality

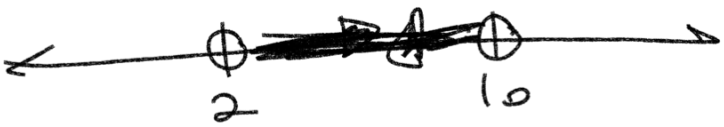
$7\left(\frac{b}{7}\right) < (2)7$ $\quad 7\left(\frac{b}{7}\right) > (-2)7$

$b < 14$ $\quad b > -14$

$|x-6| < 4$

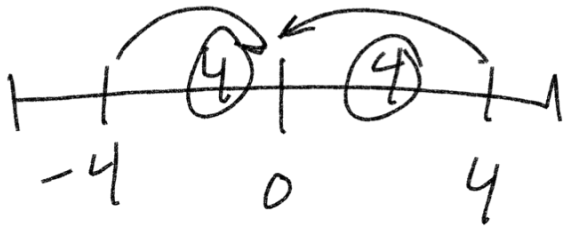
$x-6 < 4$
$+6 \quad +6$
$x < 10$

$x-6 > -4$
$+6 \quad +6$
$x > 2$



$|x-2| > -3$

all solutions



$|4| = 4 \quad |-4| = 4$

$|x-2| < -3$

no solution

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

$-4 \quad -4$

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

no solution

(2) $-4|x| < -8$

no solution

$\{ |4+9x| \leq 5$

flip inequality opposite sign

$4+9x \leq 5$

$-4 \quad -4$

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

$4+9x \geq -5$

$-4 \quad -4$

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

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

$x \geq -1$

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

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

$|10x+2| \leq 22$

positive ⇒ keep going

flip inequality to make opposite sign.

$10x+2 \leq 22$
$-2 \quad -2$

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

$x \leq 2$

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

$\frac{10x}{10} \geq \frac{-24}{10} \div 2 = -\frac{12}{5}$

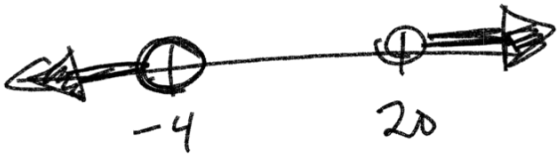
$x \geq -\frac{12}{5}$

① $|x-8| > 12$

$x-8 > 12$ or $x-8 < -12$

$+8 \quad +8 \qquad +8 \quad +8$

$x > 20$ or $x < -4$



② $|9x+5| < 41$

$9x+5 < 41$ or $9x+5 > -41$

$-5 \quad -5 \qquad -5 \quad -5$

$\frac{9x}{9} < \frac{36}{9} \qquad \frac{9x}{9} > \frac{-46}{9}$

$x < 4 \qquad x > \frac{-46}{9}$