T-A1 Algebra 1 Week 18

3-6 Absolute Value Equations and Inequalities

positive

$|x| = 6$

6 -6

$|x| = 6$

$x = 6$ $x = -6$

$|x - 2| = 18$

$x - 2 = 18$
$+2 \quad +2$
$x = 20$

$x - 2 = -18$
$+2 \quad +2$
$x = -16$

$|4x + 6| = 18$

rewrite

$4x + 6 = 18$
$-6 \quad -6$
$\frac{4x}{4} = \frac{12}{4}$
$x = 3$

$4x + 6 = -18$
$-6 \quad -6$
$\frac{4x}{4} = \frac{-24}{4}$
$x = -6$

isolate the absolute value

$|x - 6| + 3 = 8$
$-3 \quad -3$
$|x - 6| = 5$

$x - 6 = 5$ (+)
$+6 \quad +6$
$x = 11$

$x - 6 = -5$ (−)
$+6 \quad +6$
$x = 1$

1, 11

11, 1

Check

$|x - 6| + 3 = 8$ ✓

$x = 11$

$|11 - 6| + 3$
$|5| + 3 = 5 + 3 = 8$ ✓

$x = 1$

$|x - 6| + 3$
$|1 - 6| + 3$
$|-5| + 3 = 5 + 3 = 8$ ✓

$3|x+8|+12=9$

$-12 \quad -12$

$\frac{3|x+8|}{3}=\frac{-3}{3}$

$|x+8|=-1$ ← negative

Absolute values cannot be negative!

No solution

$-4|x+8|-8=12$

$+8 \quad +8$

$\frac{-4|x+8|}{-4}=\frac{20}{-4}$

$|x+8|=-5$

no solution

$-2|3x+2|+8=4$

$-8 \quad -8$

$\frac{-2|3x+2|}{-2}=\frac{-4}{-2}$

$|3x+2|=2$

$3x+2=2$ | $3x+2=-2$

$-2 \quad -2$ | $-2 \quad -2$

$\frac{3x}{3}=\frac{0}{3}$ | $\frac{3x}{3}=\frac{-4}{3}$

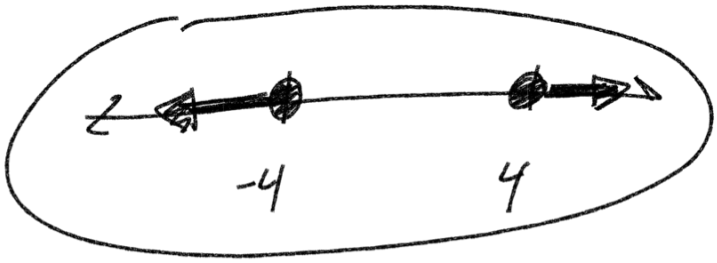
$x=0$ | $x=-\frac{4}{3}$

$-\frac{4}{3}, 0$ | $0, -\frac{4}{3}$

$|x| \geq 4$

flip inequality negative

$x \geq 4$ $\quad$ $x \leq -4$



$|x| + 3 < 9$

$-3 \quad -3$

$|x| < 6$

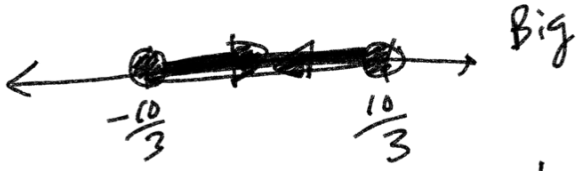
$x < 6$ $\quad$ $x > -6$

$-3|x| \geq -10$

$\frac{-3}{-3} \quad \frac{-10}{-3}$

$|x| \leq \frac{10}{3}$

$x \leq \frac{10}{3}$ $\quad$ $x \geq \frac{-10}{3}$



$4|x-3| + 8 < 4$

$-8 \quad -8$

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

$|x-3| < -1$

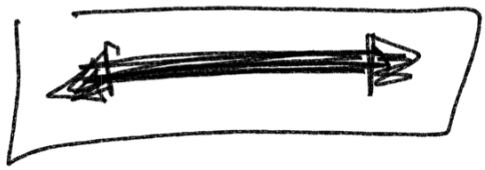
no solution

$|x-3| = -1$

no solution

$|3x+8| \geq -12$

all solutions!



$3|x-5|-4 \geq 11$

$+4 \quad +4$

$\frac{3|x-5|}{3} \geq \frac{15}{3}$

$|x-5| \geq 5$

$x-5 \geq 5$ $\quad +5 \quad +5$

$x \geq 10$

$x-5 \leq -5$ $\quad +5 \quad +5$

$x \leq 0$

HW

ch 3.6 evens

supplemental WS

Online HW 18 } Feb 16th

Quiz 18

HW/Quiz 16 due tonight

HW/Quiz 17 due Feb 9th