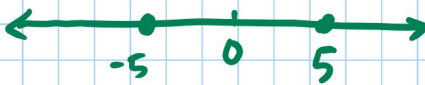


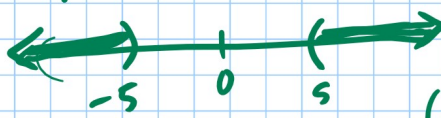
WARMUP

Find 2 solutions to each, one negative and one positive

$$|A| = 5 \quad 5 \text{ and } -5$$
A number line with arrows at both ends, marked with -5, 0, and 5. There are solid dots at -5 and 5, and a horizontal line segment connects them.

$$|A| < 5 \quad 4 \text{ and } -4$$
A number line with arrows at both ends, marked with -5, 0, and 5. There are open parentheses at -5 and 5, and a horizontal line segment connects them. To the right of the number line is the interval notation $(-5, 5)$.

"what numbers are less than 5 away from 0?"

$$|A| > 5 \quad 6 \text{ and } -753$$
A number line with arrows at both ends, marked with -5, 0, and 5. There are open parentheses at -5 and 5, and horizontal arrows extend from these parentheses outwards. To the right of the number line is the interval notation $(-\infty, -5) \cup (5, \infty)$.

Section 9.3 Absolute Value Equations and Inequalities

To solve an absolute value equation $|X| = c$

set $X = c$ or $X = -c$

ex: $|2x - 3| = 11$

$$\begin{array}{r} 2x - 3 = 11 \\ +3 \quad +3 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{14}{2}$$

$$x = 7$$

or $\begin{array}{r} 2x - 3 = -11 \\ +3 \quad +3 \\ \hline \end{array}$

$$\frac{2x}{2} = \frac{-8}{2}$$

$$x = -4$$

$$7 \text{ and } -4 \quad \text{OR} \quad \{7, -4\}$$

$$\text{ex: } 2|1-3x| - 28 = 0$$

$$\frac{2|1-3x|}{2} = \frac{28}{2}$$

isolated the absolute value

$$|1-3x| = 14$$

$$1-3x = 14$$

$$\frac{-1}{-1} \quad \frac{-1}{-1}$$

$$-3x = 13$$

$$\frac{-1}{-1} \quad \frac{-1}{-3}$$

$$x = -\frac{13}{3}$$

$$1-3x = -14$$

$$\frac{-1}{-1} \quad \frac{-1}{-1}$$

$$-3x = -15$$

$$\frac{-1}{-1} \quad \frac{-1}{-3}$$

$$x = 5$$

$$\boxed{-\frac{13}{3} \text{ and } 5}$$

Do 1 and 2 on 9.3 worksheet

Absolute Value Inequalities

1) If $|x| < c$ then $-c < x < c$ ($|x| \leq c \Rightarrow -c \leq x \leq c$)

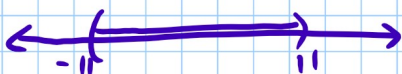
2) If $|x| > c$ then $x < -c$ or $x > c$

($|x| \geq c \Rightarrow x \leq -c$ or $x \geq c$)

ex: $|x| < 11$

$$-11 < x < 11$$

$$(-11, 11)$$

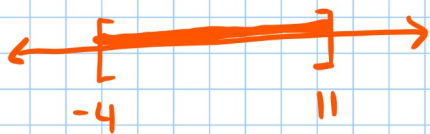


$$\text{ex: } |2x - 7| \leq 15$$

$$\begin{array}{r} -15 \leq 2x - 7 \leq 15 \\ +7 \quad \quad +7 \quad +7 \end{array}$$

$$\frac{-8}{2} \leq \frac{2x}{2} \leq \frac{22}{2}$$

$$-4 \leq x \leq 11$$



$$[-4, 11]$$

9.3 worksheet
3-6

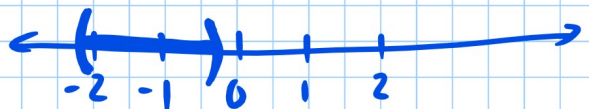
$$5) \frac{|7x+9| + 1}{-1} < \frac{7}{-1}$$

$$|7x+9| < 6$$

$$-6 < 7x+9 < 6$$

$$-15 < 7x < -3$$

$$-\frac{15}{7} < x < -\frac{3}{7}$$



$$\left(-\frac{15}{7}, -\frac{3}{7}\right)$$

$$\text{ex: } \frac{|3x+7| + 2}{-2} < \frac{-10}{-2}$$

$$|3x+7| < -12$$

no solutions \emptyset

$$|5x+3| \geq -7$$

all real numbers
 $(-\infty, \infty)$

ex: $|x| \geq c$
 $|3x + 2| \geq 11$

$x \leq -c$
 $3x + 2 \leq -11$
 $\frac{3x}{3} \leq \frac{-13}{3}$

OR
OR

$x \geq c$
 $3x + 2 \geq 11$
 $\frac{3x}{3} \geq \frac{9}{3}$

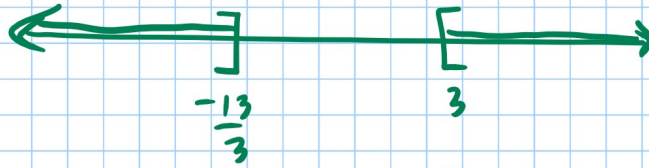
$x \leq -\frac{13}{3}$

$x \geq 3$

$x \leq -\frac{13}{3}$

OR

$x \geq 3$



$(-\infty, -\frac{13}{3}] \cup [3, \infty)$

Finish w.s. 9.3