

Algebra 1

5.5

Solve and graph absolute value inequalities

inequality

absolute value

less than $\leq$

greater than $\geq$

number line & distance
whiteboards

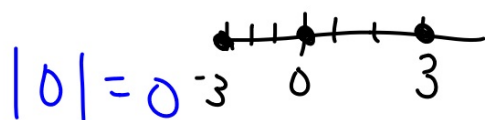
distance from zero

can't be neg

$$|(-3)| = 3$$



$$|-\frac{1}{4}| = \frac{1}{4}$$



$$|(3-5)|$$
$$|-2| = 2$$

Gr. 6-7 standard

$$|???| = 5$$

$$\downarrow$$

$$|-5| = 5$$

$$|5| = 5$$



$$|?| = 13$$

$$\downarrow$$

$$|-13| = 13$$

$$|13| = 13$$



$$|-2+3| = 5$$

$$|-5| = 5 \text{ "}$$

$$|x-3| = 5$$

$$|8+3| = 5$$

$$|5| = 5 \text{ "}$$

$$x-3 = 5$$

$$+3 \quad +3$$

$$x-3 = 5$$

$$+3 \quad +3$$

$x = -2$	$x = 8$
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$|2 \cdot -9 + 5| = 13$
 $| -18 + 5 | = 13$
 $| -13 | = 13$

absolute value = distance (from zero)

$|2x + 5| = 13$

$|2 \cdot 4 + 5| = 13$
 $|8 + 5| = 13$
 $|13| = 13$

$2x + 5 = -13$
 $-5 \quad -5$

 $2x = -18$
 $x = -9$

$2x + 5 = 13$
 $-5 \quad -5$

 $2x = 8$
 $x = 4$

$x = -9$ $x = 4$

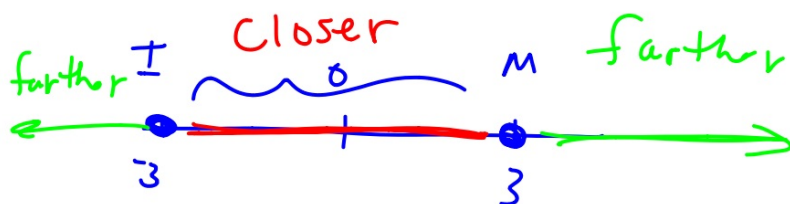
Solve:

$$|2x - 1| = 9$$

$$\begin{array}{r}
 2x - 1 = -9 \\
 +1 \quad +1 \\
 \hline
 2x = -8 \\
 x = -4
 \end{array}$$

$$\begin{array}{r}
 2x - 1 = 9 \\
 +1 \quad +1 \\
 \hline
 2x = 10 \\
 x = 5
 \end{array}$$

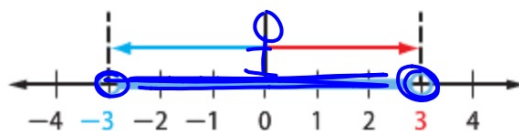
Number line
stand 3 steps away



Where is 3 away?
Where is closer than
3?
Where is farther than
3?



1 Absolute Value Inequalities (<) The inequality $|x| < 3$ means that the distance between x and 0 is less than 3.



$$|x| = -3 \quad |x| = 3$$

$< = \text{closer}$
 $> = \text{farther}$

Exa

Solve Absolute Value Inequalities ($<$)

Find the landmarks

Solve each inequality. Then graph the solution set.

a. $|m + 2| < 11$

Distance = 11

What might have been inside the $||$ originally?

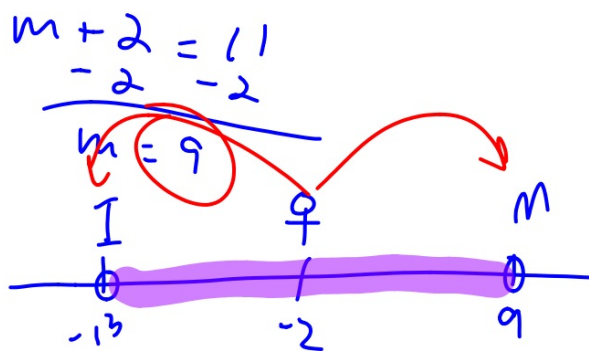
Find each end.

Is the distance less or more?

Where is the middle?

$$\begin{array}{r} m+2 \\ -2 \end{array} = \begin{array}{r} -11 \\ -2 \end{array}$$

$$m = -13$$



$$-13 < x < 9$$



1A. $|n - 8| \leq 2$

What could have been inside?

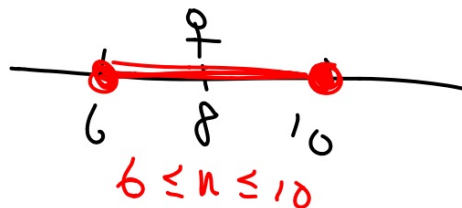
Find each end

Is the distance less or more?

What is in the middle?

$$\begin{array}{r} n - 8 = -2 \\ + 8 \quad + 8 \\ \hline n = 6 \end{array}$$

$$\begin{array}{r} n - 8 = 2 \\ + 8 \quad + 8 \\ \hline n = 10 \end{array}$$

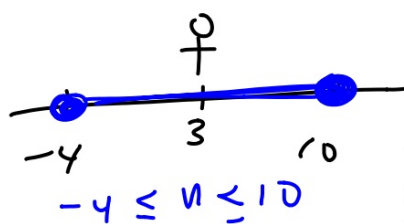


b. $\boxed{} - 2$ NS

$$|n - 3| \leq 7$$

$$\begin{array}{r} n - 3 = -7 \\ +3 \quad +3 \\ \hline n = -4 \end{array}$$

$$\begin{array}{r} n - 3 = 7 \\ +3 \quad +3 \\ \hline n = 10 \end{array}$$



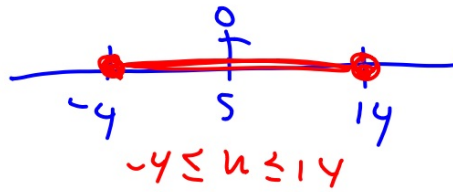
What could have been inside? :(
Find each end
Is the distance less or more?
What is in the middle?

trick question :(

$$|n-5| \leq 9$$

$$\begin{array}{r} n-5 = -9 \\ +5 \quad +5 \\ \hline n = -4 \end{array}$$

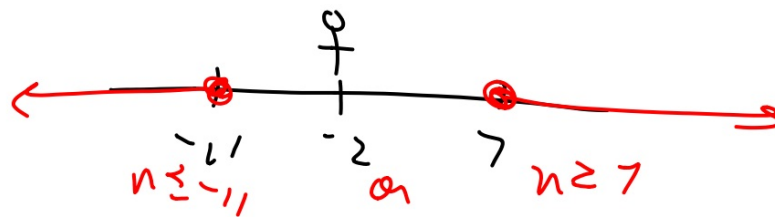
$$\begin{array}{r} n-5 = 9 \\ +5 \quad +5 \\ \hline n = 14 \end{array}$$



$$|n+2| \geq 9$$

$$\begin{array}{r} n+2 = -9 \\ -2 \quad -2 \\ \hline n = -11 \end{array}$$

$$\begin{array}{r} n+2 = 9 \\ -2 \quad -2 \\ \hline n = 7 \end{array}$$



p. 314 9-35 oed



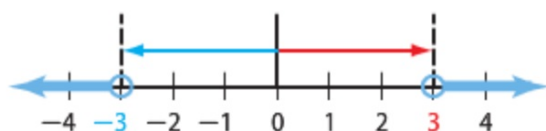
Real-World Example 2 Apply Absolute Value Inequalities

INTERNET A recent survey showed that 65% of young adults watched online video clips. The margin of error was within 3 percentage points. Find the range of young adults who use video sharing sites.

Guided Practice

2. **CHEMISTRY** The melting point of ice is 0°C . During a chemistry experiment, Jill observed ice melting within 2°C of this measurement. Write the range of temperatures that Jill observed.

2 Absolute Value Inequalities ($>$) The inequality $|x| > 3$ means that the distance between x and 0 is greater than 3.



Example 3 Solve Absolute Value Inequalities ($>$)

Solve $|\square| \square 12$. Then graph the solution set.

distance = 12

What could have been inside?
Find each end
Is the distance less or more?
What is in the middle?

Solve each inequality. Then graph

3A. $| \square | \square 7$

What could have been inside?

Find each end

Is the distance less or more?

What is in the middle?

3B. $\boxed{} - \boxed{} = 5$

What could have been inside? :(
 Find each end
 Is the distance less or more?
 What is in the middle?

trick question

