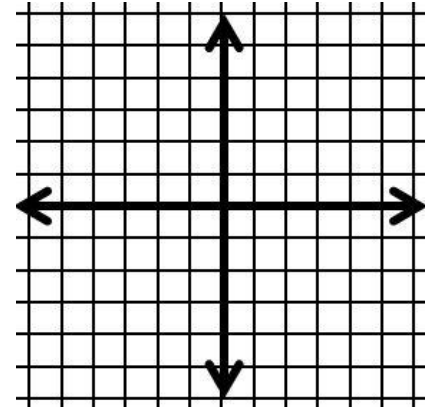


Absolute Value Equations

Graph of the Parent Function for Absolute Value Functions

$$f(x) = |x|$$

x	x	f(x)
-2		
-1		
0		
1		
2		



An Absolute Value Equation is

Example:

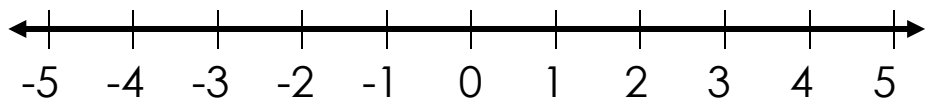
$$\text{Solve } |x| = 9$$

What is absolute value?

Recall:

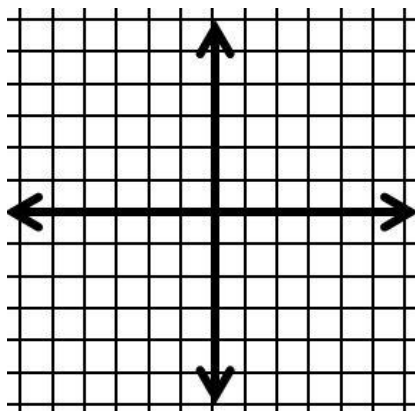
Absolute value is _____

Example: $|4| =$ $|-4| =$



Example 5:

Graph $f(x) = |x - 2|$



Graph absolute value equations

Example 1:

Solve $|x + 4| = 3$

Example 2:

Solve $3|13 - 2x| = 15$

Example 3:

Solve $3|4x + 2| - 7 = 11$

SPECIAL CASE!

Example 4:

Solve $|3x + 5| + 6 = -2$

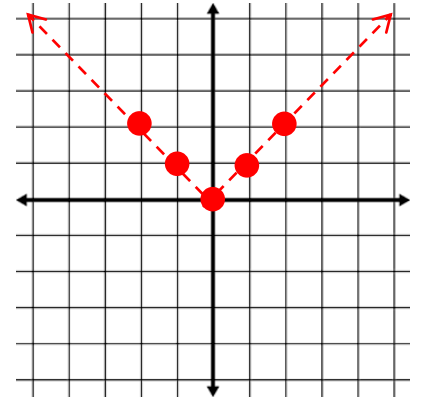
Solve absolute value equations

Absolute Value Equations

Graph of Parent Function for Absolute Value Functions

$$f(x) = |x|$$

x	x	f(x)
-2	$ -2 $	2
-1	$ -1 $	1
0	$ 0 $	0
1	$ 1 $	1
2	$ 2 $	2



An Absolute Value Equation is

An equation that includes an absolute value expression

Example:

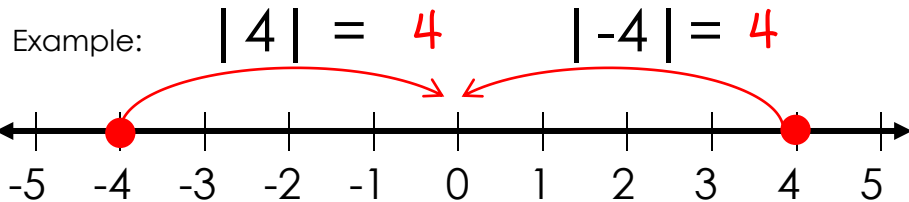
$$\text{Solve } |x| = 9$$

$$x = 9 \quad \text{or} \quad x = -9$$

What is absolute value?

Recall:

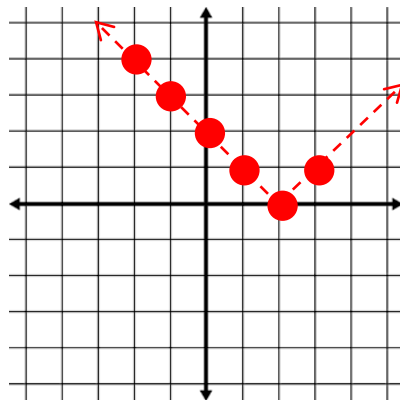
Absolute value is the distance a number is away from zero on the number line.



Example 5:

Graph $f(x) = |x - 2|$

x	$ x-2 $	$f(x)$
-2	$ -2-2 $	4
-1	$ -1-2 $	3
0	$ 0-2 $	2
1	$ 1-2 $	1
2	$ 2-2 $	0
3	$ 3-2 $	1



Example 1:

Solve $|x + 4| = 3$

$$\begin{array}{r} x + 4 = 3 \\ -4 \quad -4 \\ \hline x = -1 \end{array}$$

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

Example 2:

Solve $3|13 - 2x| = 15$

$$\begin{array}{r} 13 - 2x = 5 \\ -13 \quad -13 \\ \hline -2x = -8 \\ -2 \quad -2 \\ \hline x = 4 \end{array}$$

$$\begin{array}{r} 13 - 2x = -5 \\ -13 \quad -13 \\ \hline -2x = -18 \\ -2 \quad -2 \\ \hline x = 9 \end{array}$$

Example 3:

Solve $3|4x + 2| - 7 = 11$

$$\begin{array}{r} +7 \quad +7 \\ \hline 3|4x + 2| = 18 \\ 3 \quad 3 \\ \hline |4x + 2| = 6 \end{array}$$

$$\begin{array}{r} 4x + 2 = 6 \\ -2 \quad -2 \\ \hline 4x = 4 \\ 4 \quad 4 \\ \hline x = 1 \end{array}$$

$$\begin{array}{r} 4x + 2 = -6 \\ -2 \quad -2 \\ \hline 4x = -8 \\ 4 \quad 4 \\ \hline x = -2 \end{array}$$

SPECIAL CASE!

Example 4:

Solve $|3x + 5| + 6 = -2$

$$\begin{array}{r} -6 \quad -6 \\ \hline |3x + 5| = -8 \end{array}$$

No solutions because the absolute value of a number can never be negative

Graph absolute value equations

Solve absolute value equations

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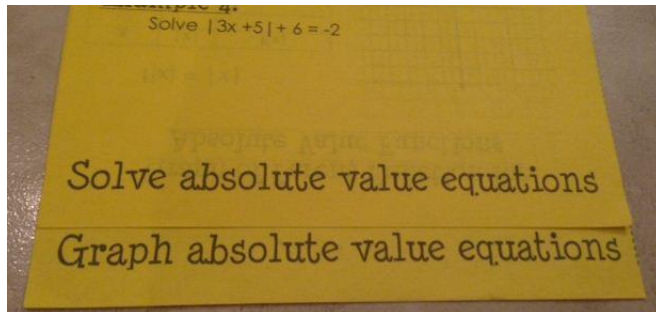
(<http://www.teacherspayteachers.com/Store/Lisa-Davenport>)

Directions:

Step 1: Print the first two pages front to back so that they look like this:

Step 2: Cut down the center (along the dotted line)

Step 3: Line up the half sheets so that it looks like this:



Step 4: Fold down the top part of both sheets and staple at the top.

