**Step 1** – Get the absolute value expression by itself on one side of the equation.

*Ex.* $|2x + 7| = 5$ → This is ready for Step 2! 

*Ex.* $11 = |x - 9|$ → This is ready for Step 2! 

*Ex.* $3|x - 1| = 21$ → This is **not ready** for Step 2! Divide by 3 to get
$|x - 1| = 7$ Now it is ready for Step 2.

*Ex.* $|x + 4| + 8 = 17$ → This is **not ready** for Step 2! Subtract by 8 for
$|x + 4| = 9$ Now it is ready for Step 2.

*Ex.* $-|3x - 12| = -21$ → This is **not ready** for Step 2! Multiply by $-1$
$|3x - 12| = 21$ Now it is ready for Step 2.

**Step 2** – Check the number on the other side of the equation. If it is negative, then you are done and the answer is "no solution" since there are no real numbers with absolute values $< 0$.

*Ex.* $|2x + 8| = -5$ → there are no real numbers with an absolute value of $-5$, so there is **no solution**.

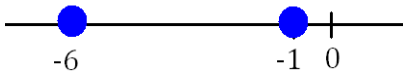
*Ex.* $|3x + 4| - 11 = -2$ → Hey… this doesn't even belong here!!! This problem hasn't gone through Step 1, so we can't apply Step 2. Just because there is an absolute value on one side of the equation and a negative number on the other side doesn't mean there is no solution – get the absolute value by itself first (so go back to Step 1 and don't come back here until you're done!!!)

**Step 3** – Solve two equations from what you have using the positive and negative values of the number that is on the other side of the = sign.

*Ex.* You have $|2x + 7| = 5$. Make these two equations:

$$2x + 7 = 5 \quad \text{or} \quad 2x + 7 = -5$$
$$2x = -2 \quad \text{or} \quad 2x = -12$$
$$x = -1 \quad \text{or} \quad x = -6$$

So $\boldsymbol{x = -6, -1}$.

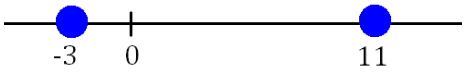



You can check your work and see that both answers make the original equation true! They are the only places on the number line that work, so they are the only things colored in.

*Ex.* You have $|3x - 12| = 21$. Make these two equations:

$$3x - 12 = 21 \quad \text{or} \quad 3x - 12 = -21$$
$$3x = 33 \quad \text{or} \quad 3x = -9$$
$$x = 11 \quad \text{or} \quad x = -3$$

So $\boldsymbol{x = -3, 11}$.




*Ex.* You have $|4x + 1| = 0$. You can make only one equation:

$$4x + 1 = 0$$
$$4x = -1$$
$$\boldsymbol{x = -\frac{1}{4}}$$