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## Absclufe Value Teaching Tips:

Thank you for downloading this Absolute Value lesson from Math Geek Mama! I hope you find it helpful in "demystifying" this important math concept. Here are a few tips for using this lesson, and ideas to incorporate it into your classroom.

## Lesson Teaching Tips:

- Begin by exploring some different examples of distance, reminding students that there are no negative numbers on a measuring tape, and therefore no matter which direction you measure something (top to bottom, left or right, etc.) the measurement is still the same. Depending on the age of your students you may even want to measure something in the class two ways just to emphasis the point.
- Another example to help students understand absolute value as distance from zero is driving a car: whether you drive a mile forward or a mile in reverse, it's still one mile.
- Encourage students to draw a number line to represent EACH problem, at least for a while, so they can be sure not to make careless mistakes or simply guess when writing their two cases.
- Make sure students are shading their number lines in the correct directions to help them set up the cases, and make sure they then understand that this is a different number line from what they will use to represent their answer.
- Be careful not to equate absolute value as positive. When students have it in their head that absolute value = positive, they are quickly confused when problems get more complicated and the answer is negative. Just because the absolute value of an expression is positive does not mean the solution for $x$ must be. In addition, when there is a negative outside the absolute value bars, the solution may be negative. I have found it is better to just avoid that language altogether and stick to distance from zero.
- Finally, when students are solving absolute value inequalities, be sure to remind them that once their cases are set up, the same rules they have always used for inequalities will still apply.

Best of Lucky
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## Solving Absolute Valce Problems

## Consider the following situation:

I am driving in a new city and want to find the nearest gas station. I ask someone for directions and they tell me that there is one $\mathbf{7} \mathbf{~ b l o c k s}$ away, along the same street. So where is it? Draw a sketch of the road and possible gas station locations. (Don't forget that it could be in either direction!)
**Because absolute value means $\qquad$ from $\qquad$ you use this same
idea to set up your different cases and solve. **
Now consider the equation:

$$
|2 x+1|=7
$$

Now try one on your own (sketch on a number line first!):

$$
|x-2|=5
$$

## Now consider a different situation:

I ask someone else where to find a gas station, and this person tells me that it is on this street, more than $\mathbf{3}$ blocks away. Draw a sketch of the possible locations.
$\qquad$

## Consider the following inequality:

$$
|2 x+1|>3
$$

Now try one on your own (Sketch on a number line first!):
$|3 x|>6$

## One last situation:

I am still looking for a gas station. Another person answers my question by saying that it is on this same street, less than 5 blocks away. Again, sketch the possible locations.

Consider the following inequality:

$$
|2 x+1|<5
$$

Now try one on your own (Sketch on a number line first!):

$$
|4 x-8|<20
$$

$\qquad$

## Solving Absolute Value Problems

## Consider the following situation:

I am driving in a new city and want to find the nearest gas station. I ask someone for directions and they tell me that there is one $\mathbf{7}$ blocks away, along the same street. So where is it? Draw a sketch of the road and possible gas station locations. (Don't forget that it could be in either direction!)
**Because absolute value means $\qquad$ distance $\qquad$ from $\qquad$ zero $\qquad$ you use this same idea to set up your different cases and solve. **

Now consider the equation:

$$
\begin{gathered}
|2 x+1|=7 \\
2 x+1=7 \text { or } 2 x+1=-7
\end{gathered}
$$

Therefore,

$$
x=3 \text { or } x=-4
$$

Now try one on your own (sketch on a number line first!):

$$
\begin{gathered}
|x-2|=5 \\
x=7 \text { or } x=-3
\end{gathered}
$$

Now consider a different situation:

I ask someone else where to find a gas station, and this person tells me that it is on this street, more than 3 blocks away. Draw a sketch of the possible locations.
$\qquad$

## Consider the following inequality:

$$
\begin{gathered}
|2 x+1|>3 \\
2 x+>3 \text { or } 2 x+1<-3
\end{gathered}
$$

Therefore,

$$
x>1 \text { or } x<-2
$$

Now try one on your own (Sketch on a number line first!):

$$
\begin{gathered}
|3 x|>6 \\
x>2 \text { or } x<-2
\end{gathered}
$$

## One last situation:

I am still looking for a gas station. Another person answers my question by saying that it is on this same street, less than 5 blocks away. Again, sketch the possible locations.

Consider the following inequality:

$$
\begin{gathered}
|2 x+1|<5 \\
2 x+1<5 \text { and } 2 x+1>-5
\end{gathered}
$$

Therefore,

$$
-3<x<2
$$

Now try one on your own (Sketch on a number line first!):

$$
\begin{gathered}
|4 x-8|<20 \\
-3<x<7
\end{gathered}
$$

