

Solving absolute value equations

NAME:

This worksheet is designed to help you make sense of the methods we use to solve absolute value equations algebraically.

1a. Consider the equation $|4x - 2| = 7$. If this equation is true, what must be true of the number $4x - 2$? Why? (In other words, what two numbers could this number, $4x - 2$, possibly be? How do you know for sure?)

1b. Use what we know about the number $4x - 2$ to rewrite $|4x - 2| = 7$ as two equations. (Notice the absolute value signs are gone at this point.) Then solve them to find the two solutions to $|4x - 2| = 7$.

1c. Check your two solutions. Do they make the original equation true?

2. Solve the equation $|6 + 3x| - 4 = 10$ algebraically. Isolate the absolute value part before you use the procedure above and show your work. Write your solutions as fractions in simplest terms.

3. Why does the equation $|4x + 5| = -3$ not have a solution? In other words, what about absolute value tells you that this equation can have no solution?

4. If you know the absolute values of two numbers are equal, what must be true of the numbers? There are two possibilities here.