Solving absolute value equations

NAME:

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

1. Consider the equation |w| = 7. Why can we algebraically follow this with w = 7 or w = -7? (In other words, what about absolute value tells us that w would have to be 7 or -7? What does the absolute value of a number really tell us?)

2a. Use this idea to rewrite |4x-2| = 7 as two equations. (Notice the absolute value signs are gone at this point.) Then solve these equations separately to find the two solutions to |4x-2| = 7.

2b. Check your two solutions *in the original equation*. Show your work. Label which solution you are checking so I can follow your work. Do the solutions make the original equation true?

3. 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.

4. 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?