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Absolute value equations and answer

Solving the equation of absolute value is as simple as working with regular linear equations. The only additional key step to remember is to separate the original absolute value equation into two parts: the positive and negative (±) components. Below is a general approach on how to break them down into two equations: In addition, we must also consider the following key points regarding the above set: Key points to remember when solving absolute value equations Key point #1: Character \left| x \right| must be positive. For emphasis, \left| x \right| \to + \left| x \right|. Key points #2: X within absolute value symbol, \left| They can be any expression. Key point #3: A on the right side of the equation must be either a positive number or zero to have a solution. Key point #4: If a on the right is a negative number, then it has no solution. Examples Of Solving an Equation of Absolute Value Example 1: Solving the equation of absolute value \left| x \right| =\, - 5 . The absolute value of any number is positive or zero. But this equation shows that there is a number, that its absolute value is negative. Can you sit down with all the numbers that can make the equation the truth? Well, there's no one. Since there is no x value that can satisfy the equation, we say it has no solution. In essence, the following equations of absolute values do not contain solutions. Example 2: Absolute Value Equation Solution - \left| x \right| =\, - 5 . Don't be quick to conclude that this equation has no solution. Although the true side of the equation is negative, the expression of absolute value must be positive. But it's not, is it? Key points #1: character \left| x \right| must be positive. For emphasis, \left| x \right| \to + \left| x \right|. First, we must eliminate the negative symbol of the absolute value before we can proceed. Note that the formula formula a number has a coefficient of −1. Split both sides of the equation with this value to get rid of the negative character. Since the expression of absolute value and number are positive, we can now use the procedure to break it down into two equates. Therefore, the solution to the problem becomes You can check our answers by replacing them back to the original equation. I'il leave it to you. Example 3: Solving the absolute value equation \left| {x - 5} \right| == 3. This problem is becoming interesting because the expression within the absolute value symbol is no longer just one variable. Don't worry about it. setting remains the same. Be careful when you break down a particular absolute value equation into two simpler linear equations, and then continue how you usually solve equations. You can check the answers back to the original equation. Example 4: Absolute value equation solution \left| - 2x + 7} \right| == 25 . You may think that this problem is complicated by –2 next to the variable x. However, this should not intimidate you. the key idea remains the same. On the one hand, we have an absolute value symbol and a positive number on the other. Saving this is like another day in the park! Break it down into + and - components, and then solve each equation. Example 5: Solving the absolute value equation \left| - 6x + 3} \right| - 7 = 20. This one is not yet ready to be separated into two components. For? This is because the absolute value symbol is not alone on one side of the equation. If you look at it, it's on the left side -7, which needs to be eliminated first. Once we get rid of this, we can continue as usual. Remove -7 on the left side by adding both sides with \color{blue}7. We have an equation of absolute value that can be broken down into two pieces. Example 6: Absolute Value Equation Solution - 7\left| {9\, - 2x} \right| + 9 =\, - 12. The expression of absolute value is not yet isolated. First, remove +9 and then -7, which is currently multiplying the absolute value expression. Let's split them into two examples and solve each equation. Example 7: Solving the absolute value equation \left| {{x^2} + 2x - 4} \right| =4. This is an interesting problem because we have a square expression within the symbol of absolute value. I hope you don't mind what it looks like! If you're faced with a situation that you're not sure how to proceed with, you're keeping up with the basics and things you already know. We don't care about things within the symbol of absolute value. As long as it is isolated and the other side is a positive number, we can certainly use the rule to split the equation into two examples. In fact, the only difference in this problem from what you've been doing so far is that instead of linear equations, you're going to solve square equations. We can check whether our four answers or solutions are x = - \,4, -2, 0 and 2, with a graph of two functions and a view of their intersection points. Solve absolute values Equation Worksheets You may also be interested: Graphical functions absolute valueSucute inequality Absolute number a is written as $$\left | a \right |$$ And represents the distance between a and 0 in the number of lines. An equation of absolute value is an equation that contains an expression of absolute value. Equation $$\left | x \right |=a$$ Has two solutions x = a and x =-a, because both numbers are at a distance of 0. To solve the absolute value equation as $$\left | x+7 \right |=14$ $ You start by making it into two separate equations, and then working it out separately. $$x+7 =14$$$x+7\, {\color{green} {-\, 7},\, =14\, {\color{green} {-\, $7}}$$x=$$x or $$x+7 =-$$$$x+7\, {\color{green} {-\, 7}}\, =-14\, {\color{green} {-\, 7}$$$$x=$$x$$A absolute value equation has no solution if the absolute value expression equals a negative number since absolute value can never be negative. Inequality $$\left | x \right |<2 Represents the distance between in 0, ki je manj kot 2, neenakost $\left | x \right |>2$$ Predstavlja razdaljo med x in 0, ki je večja od 2 Lahko napišete absolutno neenakost vrednosti kot neenakost spojin. $$\levo | x \desno | <2\: or=></2\:> <> <2$$ this= holds= true= for= all= absolute= value= inequalities.= $$\left= |= ax+b= \right=></2$$> <c,\: where\:= c=>0$$ $$=-c <> <c$$ $$\left= |= ax+b= \right= |=>c,\: kje\: c>0$$ $$=ax+b<-c\: or\:= ax+b=>c$$ < with= ≤.= when= solving= an= absolute= value= inequality= it's= necessary= to= first= isolate= the= absolute= value= expression= on= one= side= of= the= inequality= before= solving= the= inequality.= example= solve= the= absolute= value= inequality= $$2\left= |3x+9= \right=> <36$$ $$\frac{2\left= |3x+9= \right=></36$$> <\frac{36}{2}$$ $$\left= |= 3x+9= \right=></\frac{36}{2}$$> <18$$></18$$> <> <18$$ $$-18\ ,= {\color{green}= {-\,=></18$$> <3x+9\, {\color{green}= {-\,=></3x+9\,> <18\, {\color{green}= {-\,= 9}}$$=></18\,> <> <9$$ $$\frac{-27}{{\color{green}=></9$$> <\frac{3x}{{\color{green}></\frac{3x}{{\color{green}> <\frac{9}{{\color{green} 3}}$$=></\frac{9}{{\color{green}> <> <3$$ Video lesson Solve the absolute value equation $$4 \left |2x -1 \right | -2 = 10$$ HarderSpecial Case When we take the absolute value of a number, we always end up with a positive number (or zero). Whether the input was positive or negative (or zero), the output is always positive (or zero). For instance, | 3 | = 3, and | –3 | = 3 also. This property — that both the positive and the negative become positive — makes solving absolute-value equations a little tricky. But once you learn the trick, they're not so bad. Let's start with something simple: Solving Absolute Value Equations I've pretty much already solved this, in my discussion above: So then x must be equal to 3 or equal to –3. But how am I supposed to solve this if I don't already know the answer? I will use the positive / negative property of the absolute value to split the equation into two cases, and I will use the fact that the minus sign in the negative case indicates the opposite sign, not a negative number. For example, if I have x = –6, then –x indicates the opposite of x or, in this case, –(–6) = +6, a positive number. The minus sign in –x just indicates that I am changing the sign on x. It does not indicate a negative number. This distinction is crucial! Whatever the value of x might be, taking the absolute value of x makes it positive. Since x might originally have been positive and might originally have been negative, I must acknowledge this fact when I remove the absolute-value bars. I do this by splitting the equation into two cases. For this exercise, these cases are as follows: a. If the value of x was non-negative (that is, if it was positive or zero) to start with, then I can bring value out of the absolute-value bars without changing its sign, giving me the equation x = 3. b. If the value of x was negative to start with, then I can bring that value out of the absolute-value bars by changing the sign on x, giving me the equation –x = 3, which solves as x = video= lesson= solve= the= absolute= value= equation= $$4= \left= |2x= -1= \right= |= -2=10$$ harderspecial= case= when= we= take= the= absolute= value= of= a= number,= we= always= end= up= with= a= positive= number= (or= zero).= whether= the= input= was= positive= or= negative= (or= zero),= the= output= is= always= positive= (or= zero).= for= instance,= |= 3= |=3, and= |= –3= |=3 also.= this= property= —= that= both= the= positive= and= the= negative= become= positive= —= makes= solving= absolute-value= equations= a= little= tricky.= but= once= you= learn= the= trick,= they're= not= so= bad.= let's= start= with= something= simple := solving= absolute= value= equations= i've= pretty= much= already= solved= this,= in= my= discussion= above:= so= then= x= must= be= equal= to= 3= or= equal= to= –3.= but= how= am= i= supposed= to= solve= this= if= i= don't= already= know= the= answer?= i= will= use= the= positive= negative= property= of= the= absolute= value= to= split= the= equation= into= two= cases,= and= i= will= use= the= fact= that= the= minus= sign= in= the= negative= case= indicates= the= opposite= sign,= not= a= negative= number.= for= example,= if= i= have= x=–6, then= –x= = indicates= the= opposite= of= x= or,= in= this= case,= –(–6)=+6, a= positive= number.= the= minus= sign= in= –x= just= indicates= that= i= am= changing= the= sign= on= x.= it= does= not= indicate= a= negative= number.= this= distinction= is= crucial!= whatever= the= value= of= x= might= be ,= taking= the= absolute= value= of= x= makes= it= positive.= since= x= might= originally= have= been= positive= and= might= originally= have= been= negative,= i= must= acknowledge= this= fact= when= i= remove= the= absolute-value= bars.= i= do= this= by= splitting= the= equation= into= two= cases.= for= this= exercise,= these= cases= are= as= follows:= a.= if= the= value= of= x= was= non-negative= (that= is,= if= it= was= positive= or= zero)= to= start= with,= then= i= can= bring= that= value= out= of= the= absolute-value= bars= without= changing= its= sign,= giving= me= the= equation= x=3. b.= if= the= value= of= x= was= negative= to= start= with,= then= i= can= bring= that= value= out= of= the= absolute-value= bars= by= changing= the= sign= on= x,= giving= me= the= equation= –x=3, which= solves= as= x=></3$$ Video lesson Solve the absolute value equation $$4 \left |2x -1 \right | -2 = 10$$ HarderSpecial Case When we take the absolute value of a number, we always end up with a positive number (or zero). 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When trying to solve the equation of absolute value | x | =3, we are in force, we define two lines of equation equation that are the same as each other and we look for where they cross. For example: In the above I drew a graph y1 = | x | (as a blue line that looks like V) and y2 = 3 (green horizontal line). These two graphs intersect at x = -3 and at x = +3 (as two red dots). If you want to check your answers on the test (before you give it), it may be useful to plug each page of the original absolute value equation into the calculator as its function; then ask the intersection calculator. Of course, each solution can also be checked by plugging it back into the original exercise and confirming that the left side (LHS) of the equation simplifies the same value as on the right side (RHS) of the equation. For the above equation, here is my check: x = -3 LHS: | x | = | –3 | x = +3 LHS: | x | = | +3 | If you're ever in any doubt about the equation solution, try graphing, or try reconnecting your solution to the original question. Work-checking is always fine! The step to the upper, where the equation of absolute value was in two forms, one with a plus and one with a minus, gives us a handy way to simplify things: Once we've isolated absolute value and we go off the bars, we can split the equation into two examples; we will sign these cases by placing a minus on the opposite side of the equation (for one example) and plus on the opposite side (after the other). Here's how it works: The absolute value is isolated to the left side of the equation, so I'm already set to split the equation into two examples. To clear rows with an absolute value, I need to split the equation into two possible two cases, one by, if the contents of the line are absolute value (i.e. if the absolute value argument is negative) and if it is not negative (i.e. if it is positive or zero). To do this, I create two new equations where the only difference between this character is on the right. First, I will do minus example: x + 2 = –7 x + 2 = –7 x = –9 Now I will make a negative example where I can just drop the bars and solve: Now I have to check my solutions. I'm going to do this by plugging them back into the original equation, because the classor can't see me checking the plots on the grapher calculator. x = –9: LHS: | (-9) + 2| x = 5: LHS: | (5) + 2| Both solutions check, so my answer is: First, I will iolyl part of the absolute value of the equation; this means that I will myself get an expression of absolute value on one side of the sign the same, with everything else on the other side: | 2x – 3 | – 4 = 3 | 2x – 3 | = 7 Now I will clear the absolute value rows by spliting the equation into its two examples, one for each character on the argument. First, I will make a negative example: 2x – 3 = –7 2x = –4 x = And then I'm going to make a negative case: the exercise doesn't tell me to check it out, so I won't. (But if I wanted to, I could plug abs(2X-3)-4 and 3 into my calculator (like Y1 or Y2) into the calculator and see that the intersections are on my x-values.) My answer is: URL:

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