


**Write the solution set in interval notation**

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## Write the solution set in interval notation

Solve the rational inequality. write the solution set in interval notation. Solve the quadratic inequality. write the solution set in interval notation. Solve the inequality. write the solution set in interval notation calculator. Solve the inequality x. write the solution set in interval notation and graph it. Solve the following inequality. write the solution set in interval notation and graph it.

The division into two separate inequalities is not necessary here, because only the central member contains a variable. The typical properties of the numbers you already know will work without complications. o Using the interval notation (2.5). An attempt to show a line of numbers with solution 0 2 5 In our Algebra 1 course, we learned to write a solution of a inequality using the interval notation. We also have Learn to trace the graph of a range on the line of numbers. In this lesson, we will examine these concepts and we will also learn how to write a solution for a inequality using the set-builder notation. Let's see first as we do with a typical linear equation in A variable.  $2x \in \mathbb{C}$  "13A, = A, 1 2xA, = A, 14 xA, = a, 7 We can notice this solution in different ways. For most of the algebra, to say that  $XA, = A, 7$  It is generally how much we need to go. We can also write our response in notation solution-set. The set of solutions is simply a collection with solution or solutions as its elements. In this case, our set of solutions would be written as : A, (7) Three, we could use the set-builder notation. We will talk about it more detailed more in the lesson. For now, this would write as:  $\{X \mid XA, = A, 7\}$  which reads  $\in \mathbb{C}$  œThe set of all x such that X is 7. "Finally, we could show this solution graphically. We would draw a circle filled at number 7 on the line of numbers: all these ways to show our solution of  $XA, = A, 7$  are giving us the same information. Because our equation is true, x must be 7. If x is another value, the equation will not be satisfied. When we work with inequalities, generally no one is a single solution. The solution to a inequality is normally a series of values. Suppose we have a very simple inequality as:  $x > 7$  What values can be inserted for x? Essentially, whatever bigger than 7. This means that there is an infinite number of solutions. x could be replaced with 7.00 001, 8, 127, or a very large number like 138.512.3333. It doesn't matter, just the value is greater than 7. To show this type of solution, we generally use graphics, interval notations or set-builder notation. Let's start thinking about how to draw an interval on the line of numbers. When drawing an interval on the line of numbers, we must first understand the borders. When we work with inequalities, the border can be found by replacing the symbol of inequality with a symbol of equality. If we use the previous example of  $X > 7$ , to find our border we would replace the largest with an equality.  $X > 7$  border;  $XA, = a, 7$  The border separates the region of the solution from that of non-solution . From one side of the border, all the numbers will satisfy the inequality and from the other side, all They will not satisfy inequality. On the border, we have some different scenarios. If we deal with a rigorous inequality: We use a parenthesis facing the region of the solution or an open circle we use these symbols to indicate that the IL It's not part of the solution. On the other hand, we can work with inequalities not rigid. When we deal with inequalities not rigid:  $\hat{a} \leq x$  or  $\hat{a} \leq y$  We use a bracket towards the region of the solution or a closed circle We use these symbols to indicate that the border is part of the solution. This is due to the 'or equal' part of non- strict inequality. If we want to do the chart:  $x > 7$  We would put a bracket on the right at 7 and then we would shade all the values on the right of 7. We will also shadow the right arrow to indicate that all numbers are positive infinite solutions: In addition, we can show it using an open circle: If we have changed our problem until we use a non strict inequality:  $x \nless 7$  We would pass to a parentheses or a circle filled: The range notation is a convenient way to show a range on a numerical line. We will use "(" or ")" to exclude a number from the range and "[" or "]" to include a number in the range. (a , "" a left bracket "(" indicates that the value to its right is excluded. This means that our smallest value in the range is any larger value. , b)" a right bracket ")" indicates that the value to its left is excluded. This means our largest value in the space is any value that is smaller.  $1 < x < 5$  To write this in interval notation, first think about the smallest value that x can take on. Since x is larger than 1, we start by placing a left parenthesis followed by a 1 and then a paragraph: (1, 5) Now we think about the largest value. Since x is less than 5, we place a 5 followed by a right parenthesis: (1, 5) This interval (1,5) tells us that x can be any value larger than 1 up to but not including the number 5. The parenthesis in each case excludes the numbers. Essentially, x is between 1 and 5. If we change this interspersed up to use non-strict inequalities: [a , A" a left bracket "[" indicates the value to its right is included. This means our minus value in the interval is the value to the right of the left bracket. This means our largest value in the interval is the value to the left of the right bracket.  $1 \hat{a} \leq x \hat{a} \leq 5$  [1.5] This interspers Since there is no greater value, we will use the infinite in its place. The infinite is always placed next to a bracket. (3, \hat{a}) In addition, we will have to use the infinity negative "- \hat{a}" . Suppose we have something like:  $x < 3$  (-\hat{a}, 3) Here we used the infinite negative "- \hat{a}" instead of the smallest number since there is no one. x can assume any value that is smaller than 3. Finally, we want to take a look at the notation of the set-builder. This type of notation comes out ratherin college algebra and higher-level mathematics. Simply Set-Builder Notation seems:  $\{x \mid x$  has some properties} The first part is read as: "The whole x" "]" is read as: "Those that" the last part is read as: "X has a property" for now, when we hear "the set of all xs", we are saying x is a real number. We therefore become more specific by saying "those that" and finally we give our condition. Then x is a real number such as to have a specific property. Let's say we had the problem:  $x > 14$  We can write this in the set-builder notation as:  $\{x \mid x > 14\}$  Basically, this is just saying that X is a bigger real number than 14. Let's take a look at some examples that address the range notation, graphical ranges and set-builder notation. EXAMPLE 1: Write each in the Interval notation, set-builder notation, and chart the range.  $X > 9$  Notation Range: (9, \hat{a}.) Set-Builder Notation:  $\{x \mid X > 9\}$  Range chart: Example 2: Write each in Interval Notation, SET-BUILDER NEWS and Graph The range.  $-4 \hat{a} \leq X$