Inequalities word problems pdf

What do you like to solve word problems in Algebra? Are you ready to dive into the real world of inequality? I know that solving word problems in Algebra probably isn't your favorite, but there's no point in learning the skills if you don't use it. I promise to make this as easy as possible. Pay attention to the keywords below, as this will help you write inequality. Once inequality is written, you can solve the inequality using the skills you learned in our previous lessons. I've tried to give you examples that might concern your life and come in handy one day. Think of other ways you can use inequalities in real-world problems. I'd like to hear about them if you do! Before we look at the examples let's go through some of the rules and keywords to solve word problems in Algebra (or some math class). Word Problem Solving strategies read through the whole problem. Highlight the important information and keywords you need to resolve the issue. Identify your variables. Write the equation or inequality. Resolve. Write your answer in a full sentence. Check or adjust your answer. I know it always helps too, if you have keywords that help you write the equation or inequality. Here are some keywords that we associate with differences! Have these practicalities as a reference. Inequality Keywords at least - meaning greater than or equal to no more than - means less than or equal to more than - means greater than less than - means less than Ok... Let's put it into action and look at our examples. Example 1: Inequality Word Problems Keith has $500 in a savings account at the beginning of the summer. He wants to have at least $200 in his account by the end of the summer. He draws $25 each week for food, clothing and movie tickets. Write an inequality that represents Keith's situation. How many weeks can Keith withdraw money from his account? Justify your answer. Solution step 1: Highlight important information in this issue. Note: At least a keyword that notes that this issue must be written as an inequality. Step 2: Identify the variable. What don't you know? The question confirms that you do not know how many weeks. La w = number of weeksStep 3: Write your inequality.500 - 25w > 200I know you say, How did you get that inequality? I know at least the part is difficult. You'd think it means less than that at least. But... he wants the amount in his account to be at least $200 which means $200 or higher. So, we must use greater than or equal symbol. Step 4: Solve the inequality. The number of weeks keith can withdraw money from his account is 12 weeks or less. Step 5: Justify (prove the answer mathematically). I'll prove that the largest number of weeks is 12 by replacing 12 in inequality for w. You can also replace any number less than 12. 200 equals 200, my answer is correct. Some more than 12 weeks and his account balance would be less than $200. Any number of weeks less than 12 and his account would stay above $200. It wasn't that bad, was it? Let's take a look at another example. Example 2: More Inequality Word Problems Yellow Cab Taxi charges a $1.75 flat rate in addition to $0.65 per mile. Katie has no more than $10 to spend on a trip. Write an inequality that represents Katie's situation. How many miles can Katie travel without exceeding her budget? Justify your answer. Solution step 1: Highlight important information in this issue. Note: No more than keywords that mark that this issue must be written as an inequality. Step 2: Identify the variable. What don't you know? The question confirms that you don't know how many miles Katie can travel. La m = number of milesStep 3: Write inequality.0.65m + 1.75 < 10 Do you think: How did you write that inequality? It no more than can also be difficult. No more than that means you can't have more than anything, so it means you have to have less than! Step 4: Solve inequality. Since this is a real world problem and taxi is usually charging by miles, we can say that Katie can travel 12 miles or less before reaching its limit of $10.Step 5: Justify (prove the answer mathematically). Are you ready to try someone on your own now? Yes... Of course you are! Click here to move on to the word problem practice issues. Take a look at the questions that other students have sent: Home > Inequality > Inequality Word Problems Recommendations Recs If you see this message, it means we're having trouble loading external resources on to our site. If you are behind a Web filter, make sure that the domains *.kastatic.org and *.kasandbox.org are revoked. If you see this message, it means that we are having trouble loading external resources on our website. If you are behind a Web filter, make sure that the domains *.kastatic.org and *.kasandbox.org are revoked. (You may want to read Introduction to inequalities and solve differences first.) In Algebra we have inequality issues like: Sam and Alex play in the same football team. Last Saturday Alex scored three more goals than Sam, but in total they scored less than nine goals. What is possible the number of goals Alex scored? How do we solve them? The trick is to break the solution into two parts: Turn the English into Algebra. Then use Algebra to solve. Turn English to Algebra To make the English to Algebra it helps to: Read the whole thing first Make a sketch if necessary Assign letters for the values Find or train formulas We should also write down what is actually asked for, so we know where we are going and when we have arrived! The best way to learn this is by example, so let's try our first example: Sam and Alex play same football team. Last Saturday Alex scored three more goals than Sam, but in total they scored less than nine goals. What is possible the number of goals Alex scored? Assign Letters: number of goals Alex scored: A number of goals Sam scored: S We know that Alex scored 3 more goals than Sam did, so: A = S + 3 And we know that together they scored less than 9 goals: S + A < 9 We are asked how many goals Alex may have scored: A Solve: Start with: S + A < 9 A = S + 3, so:S + (S + 3) < 9 Simplify:2S + 3 < 9 Pull 3 from both sides:2S < 9 − 3 Simplify:2S < 6 Share both sides with 2:S < 3 Sam scored less than 3 goals, meaning Sam could have scored 0, 1 or 2 goals. Alex scored three more goals than Sam did, so Alex could have scored 3, 4 or 5 goals. Check: When S = 0, then A = 3 and S + A = 3 and 3 < 9 is correct When S = 1, then A = 4 and S + A = 5, and 5 < 9 is correct When S = 2, then A = 5 and S + A = 7, and 7 < 9 is correct (But when S = 3, then A = 6 and S + A = 9, and 9 < 9 are incorrect) Many more examples! Example: Out of 8 puppies there are more girls than boys. How many girl puppies can there be? Assign letters: number of girls: g number of boys: b We also know that there are 8 puppies, so: g + b = 8, which can be rearranged to b = 8 − g We also know that there are more girls than boys, so: g > b We are asked for the number of girl puppies: g Loose: Start with::g > b b = 8 − g, then:g > 8 − g Add g to both sides:g + g > 8 Simplify:2g > 8 Divide both sides by 2:g > 4 How it can be 5, 6, 7 or 8 girl puppies. Could it be 8 girl puppies? Then there would be no boys at all, and the question is not clear at that point (sometimes questions are like that). Check When g = 8, then b = 0 and g > b is correct (but is b = 0 allowed?) When g = 7, then b = 1 and g > b is correct When g = 6, then b = 2 and g > b is correct When g = 5, then b = 3 and g > b is correct (But if g = 4, then b = 4 and g > b is wrong) A quick example: Example: Joe goes into a race where he has to cycle and run. He cycles a distance of 25 km, and then runs for 20 km. His average running speed is half his average bike speed. Joe completes the race in less than 21/2 hours, what can we say about his average speeds? Assign letters: Average running speed: s So average bike speed: 2s Formulas: Speed = DistanceTime Which can be rearranged to: Time = Distance Speed We are asked for his average speeds: s and 2s The race is divided into two parts: 1. Bike distance = 25 km Average speed = 2s km / h So Time = DistanceAverage Speed = 252s hours 2. Running distance = 20 km Average speed = s km/h So Time = DistanceAverage Speed = 20s hours Joe completes the race in less than 21/2 hours The total time < 21/2 252s + 20s < 21/2 Loose: Start with:2252s + 20s < 21/2 Multiply all terms by 2s:25 40 < 5s Simplify: 65 < 5s Share both sides with 5:13 < s Swap pages: s > 13 So So average speed is greater than 13 km/h and his average speed cycling is greater than 26 km / h In this example we get to use two differences at once: Example: The speed v m / s of a ball thrown directly into the air is given by v = 20 − 10t, where t is the time in seconds. At what times will the speed be between 10 m/s and 15 m / s? Letters: speed in m/s: v time in seconds: t Formula: We are asked for the time t when v is between 5 and 15 m/s: 10 < v < 15 10 < 20 − 10t < 15 Loose: Start with:10 < 20 − 10t < 15 Pull 20 from each:10 − 20 < 20 − 10. − 20 < 15 − 20 Simplify:−10 < −10t < −5 Divide each by 10:−1 < −t < −0.5 Change characters and reverse differences:1 > t > 0.5 The is prettier to display smaller numbers first, then switch over:0.5 < t < 1 So the speed is between 10 m / s and 15 m / s between 0.5 and 1 second after. And a reasonably difficult example to conclude with: Make a sketch: We do not know the size of the tables, only their area, they can fit perfectly or not! Assign letters: the length of the room: L width of the room: W The formula for the perimeter is 2 (W + L), and we know that it is 16 m 2 (W + L) = 16 W + L = 8 L = 8 − W We also know that the area of a rectangle is the width times the length: Area = W × L And the range must be greater than or equal to 7: We are asked for possible values of W and L Let's solve: Start with: W × L ≥ 7 Substitute L = 8 − W: W × (8 − W) ≥ 7 Expand:8W − W2 ≥ 7 Include all conditions on the left side: W2 − 8W + 7 ≤ 0 This is a square inequality. It can be solved in many ways, here we will solve it by completing the space: Move the number beetmine −7 to the right side of inequality: W2 − 8W ≤ −7 Finish

the space on the left side of inequality and balance this by adding the same value to the right side of inequality the:W2 − 8W + 16 ≤ −7 + 16 Simplify:(W − 4)2 ≤ 9 Take the square root on both sides of the inequality:−3 ≤ W − 4 ≤ 3 Yes, we have two differences, because 32 = 9 AND (−3)2 = 9 Add 4 on both sides of each inequality:1 ≤ W ≤ 7 So the width must be between 1 m and 7 m (inclusive) and the length is 8-width. Check: Si W = 1, then L = 8-1 = 7, and A = 1 x 7 = 7 m2 (fits exactly 7 tables) Say W = 0.9 (less than 1), then L = 7.1, and A = 0.9 x 7.1 = 6.39 m2 (7 won't fit) Si W = 1.1 (just over 1), then L = 6.9 and A = 1.1 x 6.9 = 7.59 m2 (7 fits easily) Similarly for W around 7 m Copyright © 2020 MathsIsFun.com MathsIsFun.com

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