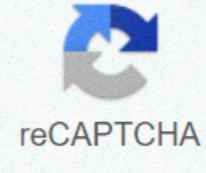




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## Algebraic equations grade 9 pdf

This Class 9 mathematical worksheet contains questions about linear equations, square equations (trinomies and square difference), simple exponential equations, and story totals according to the Grade 9 CAPS math curriculum for the third semester. Download here: [Worksheet 17: Algebraic Equations Worksheet 17 Memorandum](#) In this chapter you will find numbers that make statements true. This is called the solution of equations. They solve equations in two different ways, by inspection and by reversal. You will find that two equations can have the same solution. Such equations are called equivalent equations. Some statements are algebraic identities, others are indeed algebraic impossibility. You will learn what the difference is between these three types of instructions. Solving equations by checking Six equations are listed below the table. Use the table to find out for which of the specified values of  $x$  it is true that the left side of the equation is equal to the right side.  $-3 -2 -1 0 1 2 3 4 (2x + 3) -3 -1 1 3 5 7 9 11 1 (x + 4) 1 2 3 4 5 6 7 8 (9 - x) 12 11 10 9 8 7 6 5 -(3x - 2) -11 -8 -5 -5 -5 -11 -8 -5 -2 1 4 7 10 x 10x - 7) -37 -27 -17 -7 3 13 23 33 (5x + 3) -12 -7 -2 3 8 13 18 23 (10 - 3x) 19 16 13 10 7 4 1 -2 3 = 5x + 3, ) (5x + 3 = 9 - x) (2x + 3 = x + 4 ) (10x - 7 = 5x + 3) (3x - 2 = x + 4) (9 - x = 2x + 3) Two equations can have the same solution. For example, have the same solutions for the file  $(5x = 10)$  and  $(x + 2 = 4)$ .  $(x = 2)$  is the solution for both equations. Which of the equations in question 1 have the same solutions? Explain. Solving equations with additive and multiplicative inverses In any case, you will find the value of  $x$ . Fill in the flowcharts. You must fill in all missing numbers. Use your answers for Question 2 to review your answers for Question 1. Describe the instructions in flowchart 2(b) in words and also with a symbolic expression. Fill in the flowchart. Compare the input numbers and output numbers of the flowcharts in question 2(b) and question 5. What do you notice? Add 5 to any number, and then subtract 5 from your response. What do you get? Multiply any number by 10, and then divide the answer by 10. What do you get? If you add a number and then subtract the same number, you're back to where you started. For this reason, addition and subtraction are called inverse operations. If you multiply by a number and then divide by the same number, you are back to where you started. For this reason, multiplication and division are referred to as inverse operations The expression says multiply them by 5 and then subtract 3. This instruction can also be given with a flowchart. The equation  $5x - 3 = 47$  can also be written as a flowchart: Solve the following equations. You can do this by using the inverse operations. You can write a flowchart to see what is happening.  $(2x + 5 = 23) (3x - 5 = 16) (5x - 60 = -5) -5 + 11 = 19$  and  $19 - (10)(x + 3) = 88) (2(x - 13) = 14)$ . And 14 - Creating equations You can easily create an equation that has 5 as a solution. Here is an example: Start writing the solution  $(x = 5)$  Add 3 to both sides:  $(x + 3 = 8)$  Multiply both sides by 5  $(5x + 15 = 40)$  What is the solution of the equation  $(5x + 15 = 40)$  Make your own equation with the solution  $(x = 3)$  Bongile worked so to make the equation  $(2(x) + 8) = 30$ , but he rubbed some of his work: Start writing the solution  $(x = 5)$  Add 8 to both sides = 15 Multiply both sides by 2  $(2(x + 8) = 30)$  Complete Bongile Write to solve the equation  $(2(x + 8) = 30)$ . So Bongile made a more difficult equation: start writing the solution  $(x = 5)$  multiply by 3 on both sides , = subtract 9 from both sides, from both sides , =  $3x - 9 = 6$  Add  $(-2x)$  to both sides . . . . .$

..... What is the solution of  $5x - 9 = 2x + 6$ ??? Bongile started with a solution and he ended up with an equation. Complete the steps Bongile took to create the equation and solve the equation:  $(x) =$  .....

..... You can apply the same operation on both sides To solve an equation, you can apply the inverse operation on both sides: 4 Multiply by 8  $(8x) = 32$  Divide by 8 Add 3  $(8x + 3) = 35$  Subtract 3 Subtract  $(5x) (3x + 3) = (35 - 5x)$  the following equations.  $(5x + 3 = 24 - 2x) (2x + 4 = 9) (3 - x = x - 3) (6(2x + 1) = 0) (4(1 - 2x) = 12 - 7x) 1 - 3x) = 5(4x + 6)) (7x - 10 = 3x + 7) (1.6x + 7 = 3, 5x + 3.2)$  Which of the following rules produces the number pattern specified in the second row of the following table? A. Term value =  $6n$  where  $n$  is the term number B. Term value =  $6n - 1$  where  $n$  is the term number C. Term value =  $6n + 2$  where  $n$  is the term number D. Term value =  $10n - 2$  where  $n$  is the term number E. Term value =  $5n + 3$  where  $n$  is the term number

..... Term number 1 2 3 4 5 6 7 8 9 Term value 8 13 18 23 28 33 38 43 48 Value 33. Which term is 143? You can create an equation and solve to find out. Apply Rule E to your response to verify that your response is correct. Write the rule that creates the number pattern in the second row of this table. You may need to experiment to find out what the rule is. Term no. 1 2 3 4 5 6 7 8 9 Term value 5 8 11 14 17 20 23 26 29 Which duration is 221? The rule for number pattern A is  $4n + 11$ , and the rule for pattern B is  $(7n - 34)$ . Fill in the following table for the two patterns. TermNumber 1 2 3 4 5 6 7 8 9

..... Pattern A Pattern B For what value of  $n$  are the terms of the two patterns the same? Equation and Situations Consider this situation: To rent a room in a particular building, you have to pay a deposit of R400 and then R80 per day. How much money do you need to rent the room Days? How much money do you need to rent the room for 15 days? Which of the following best describes the method you used to use questions 1(a) and (b)? A. Total cost =  $R400 + R80 B. Total cost = 400$  (number of days + 80) C. Total cost =  $80 \cdot (\text{times})$  Number of days + 400 D. Total cost =  $(80 + 400)$  Number of days For how many days can you rent the room described in question 1 if you have to pay R2 800? If you want to know how many days you can rent the room if you have R720, you can set up and solve an equation: you know that the total cost is R720, and you know that you can calculate the total cost as follows: So,  $.80x + 400 = 720$  and  $(x = 4)$  days. In each of the following cases, locate the unknown number by setting up and solving an equation. To rent a specific room, you must pay a deposit of R300 and then R120 per day. For how many days can you rent the room if you can pay a total of R1 740? (If you're having trouble setting up the equation, it can help you first decide how to figure out how to rent the room for 6 days.) How much does it cost to rent the room for 10 days, 11 days and 12 days? For how many days can you rent the room if you have R3 300 available? For how many days can you rent the room if you have R3 000 available? Ben and Thabo decide to make some calculations with a certain number. Ben multiplies the number by 5 and adds 12. Thabo gets the same answer as Ben when he multiplies the number by 9 and subtracts 16. What number did they work with? The cost of renting a particular car for a period of 3,2 000 days can be calculated using the following formula:  $(260x + 310)$  What information do you get about renting that car when you solve the equation:  $(260x + 310 = 2 910)$ ? Sarah paid a deposit of R320 for a stand at a market, and she also pays R70 per day rent for the stand. She sells fruit and vegetables at the stand and finds that she makes about R150 profit every day. After how many days will she have earned as much as she paid for the stand? Solving equations by using the laws of exponents may need to look back at Chapter 5 to remember the laws of exponents. A kind of exponential equation that you deal with in Class 9 has one or more terms with a base that is raised to a power that contains a variable. Example:  $(2x)$  If we need to find the unknown value, we ask the question: To what power does the base need to be increased for the instruction to be true? For example, (2) Make sure that the terms  $(x)$  on a page are on their own.  $(2x = 2x(4))$  Write the known in the same basis as the term with the exponent. The exponents are equated. In the example above, we can equate the exponents, because the two numbers are equal only if they are raised to the same power. For the option  $(x)$ :  $(5x - 1 = 125 = (2x + 3 = 8$  and  $(10x = 10 000 (4x + 2 = 64) 64) 1 (x) (x - 10) = 1)$  Example: For  $(x) (3x = \frac{1}{27}) (3x) = 3x^3$  (Rewrite  $(\frac{1}{27})$  as a number based on 3)  $(x = -3)$  (Suspend the exponents.) (Suspend the exponents.) Solve for  $(x)$ .  $(7x = \frac{1}{49}) (10x = 0.001 (6.001) (6x(1) (216) = \frac{1}{216}) (10x - 1 = 0.001 = (4 - x = \frac{1}{16}) (7x = 7.3$ , the variable is in the base. If we have to find the unknown value, we ask the question: What number must be raised to the specified power for the statement to be true? For these equations, you should remember what you know about the forces of numbers like 2, 3, 4, 5, and 10. Fill in the following table and answer the following questions:  $(x) 2 3 4 5 (a)$ ,  $(x - 3) (2 - 3) = 8 (b)$ ,  $(x - 5) (2^5) = 32 (c) (x^4) (2^4) = 16$  of  $x$  is:  $(xx - 3) = 64 (x^5) = 32 (x - 4) = 256 (x - 3) = 8$  and  $(x - 4) = 16) (x - 5) = 3 125)$  and enter a reason:  $(xx - 3) = 216 - (x - 2) = 324 (x - 4) = 10 000 (8^x = 512) (18^x = 324) (6^x = 216)$  Ahmed multiplied a number by 5, added to the answer 3 and then subtracted the number, with which he had begun. The answer was 11. What number did he start with? Use any method to solve the equations.  $(3(x - 2) = 4(x + 1)) (5(x + 2) = -3 (2 - x)) (1.5x = 0.7x - 24 x)$ .  $(5(x + 3) = 5x + 12 .) ^5x = 0.5(x + 10) (7(x^2) = 7(2^x) ^{11}$

{2}