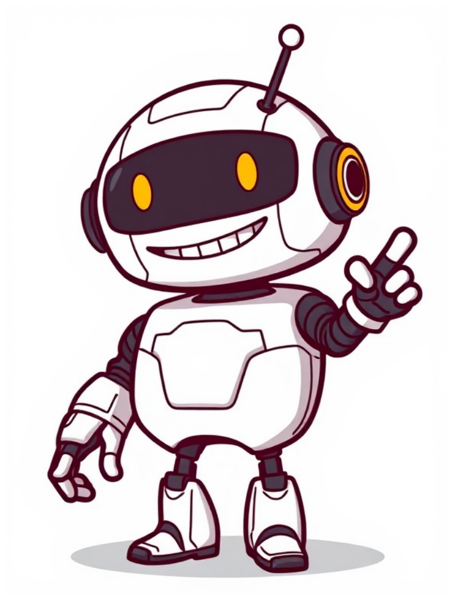
Click Here



Algebra is the branch of mathematics that helps in the representation of problems or situations in the form of mathematical expressions. It involves variables like x, y, z, and mathematical operations like addition, subtraction, multiplication, and division to form a meaningful mathematical expression. All the branches of mathematics such as trigonometry, calculus, and coordinate geometry, involve the use of algebra. One simple example of an expression in algebra is 2x + 4 = 8. Algebra deals with symbols and these symbols are related to each other with the help of operators. It is not just a mathematical concept, but a skill that all of us use in our daily life without even realizing it. Understanding algebra as a concept is more important than solving equations and finding the right answer, as it is useful in all the other topics of mathematics that you are going to learn in the future or you have already learned in the past. What is Algebra? Algebra is a branch of mathematics that deals with symbols and the arithmetic operations across these symbols. These symbols do not have any fixed values and are called variables. In our real-life problems, we often see certain values that keep on changing. But there is a constant need to represent these changing values. Here in algebra, these values are often represented with symbols such as x, y, z, p, or q, and these symbols are called variables. Further, these symbols are manipulated through various arithmetic operations of addition, subtraction, multiplication, and division, with the objective to find the values. The above algebraic expressions are made up of variables, operators, and constants. Here the numbers 4 and 28 are constants, x is the variable, and the arithmetic operation of addition is performed. Branches of Algebra The complexity of algebra is simplified by the use of numerous algebraic expressions. Based on the use and the complexity of the expressions, algebra can be classified into various branches that are listed below: Pre-algebra Elementary Algebra Abstract Algebra Universal Algebra Pre-algebra The basic ways of presenting the unknown values as variables help to create mathematical expressions. It helps in transforming real-life problems into an algebraic expression in mathematics. Forming a mathematical expression of the given problem statement is part of pre-algebra. Elementary Algebra Elementary algebra deals with solving the algebraic expressions for a viable answer. In elementary algebra, simple variables like x, y, are represented in the form of an equation. Based on the degree of the variable, the equations are called linear equations, quadratic equations, polynomials. Linear equations are of the form, ax + b = c, ax + by + c = 0, ax + by + cz + d = 0. Elementary algebra based on the degree of the variables, branches out into quadratic equations and polynomials. A general form of representation of a quadratic equation is ax2 + bx + c = 0, and for a polynomial equation, it is axn + bxn-1+ cxn-2+ .....k = 0. Abstract Algebra Abstract algebra deals with the use of abstract concepts like groups, rings, vectors rather than simple mathematical number systems. Rings are a simple level of abstraction found by writing the addition and multiplication properties together. Group theory and ring theory are two important concepts of abstract algebra. Abstract algebra finds numerous applications in computer sciences, physics, astronomy, and uses vector spaces to represent quantities. Universal Algebra All the other mathematical forms involving trigonometry, calculus, coordinate geometry involving algebraic expressions can be accounted as universal algebra. Across these topics, universal algebra studies mathematical expressions and does not involve the study of models of algebra. All the other branches of algebra can be considered as the subset of universal algebra. Any of the real-life problems can be classified into one of the branches of mathematics and can be solved using abstract algebra. Algebra Topics Algebra is divided into numerous topics to help for a detailed study. Here, we have listed some of the important topics of algebra such as algebraic expressions and equations, sequence and series, exponents, logarithm, and sets. Algebraic Expressions An algebraic expression in algebra is formed using integer constants, variables, and basic arithmetic operations of addition(+), subtraction(-), multiplication(), and division(/). An example of an algebraic expression is 5x + 6. Here 5 and 6 are fixed numbers and x is a variable. Further, the variables can be simple variables using alphabets like x, y, z or can have complex variables like x2, x3, xn, xy, x2y, etc. Algebraic expressions are also known as polynomials. A polynomial is an expression consisting of variables (also called indeterminates), coefficients, and non-negative integer exponents of variables. Example: 5x3 + 4x2 + 7x + 2 = 0. An equation is a mathematical statement with an 'equal to' symbol between two algebraic expressions that have equal values. Given below are the different types of equations, based on the degree of the variable, where we apply the concept of algebra: Linear Equations: Linear equations help in representing the relationship between variables such as x, y, z, and are expressed in exponents of one degree. In these linear equations, we use algebra, starting from the basics such as the addition and subtraction of algebraic expressions. Quadratic Equations: A quadratic equation can be written in the standard form as ax2 + bx + c = 0, where a, b, c are constants and x is the variable. The values of x that satisfy the equation are called solutions of the equation, and a quadratic equation has at most two solutions. Cubic Equations: The algebraic equations having variables with power 3 are referred to as cubic equations. A generalized form of a cubic equation is ax3 + bx2 + cx + d = 0. A cubic equation has numerous applications in calculus and three-dimensional geometry (3D Geometry). Sequence and Series A set of numbers having a relationship across the numbers is called a sequence. A sequence is a set of numbers having a common mathematical relationship between the number, and a series is the sum of the terms of a sequence. In mathematics, we have two broad number sequences and series in the form of arithmetic progression and geometric progression. Some of these series are finite and some series are infinite. The two series are also called arithmetic progression and geometric progression and can be represented as follows. Arithmetic Progression: An Arithmetic progression (AP) is a special type of progression in which the difference between two consecutive terms is always a constant. The terms of an arithmetic progression series is a, a+d, a + 2d, a + 3d, a + 4d, a + 5d, ... Geometric Progression: Any progression in which the ratio of adjacent terms is fixed is a Geometric Progression. The general form of representation of a geometric sequence is a, ar, ar2, ar3, ar4, ar5, ... Exponents Exponent is a mathematical operation, written as an. Here the expression an involves two numbers, the base 'a' and the exponent or power 'n'. Exponents are used to simplify algebraic expressions. In this section, we are going to learn in detail about exponents including squares, cubes, square root, and cube root. The names are based on the powers of these exponents. The exponents can be represented in the form an = a a a ... n times. Logarithms The logarithm is the inverse function to exponents in algebra. Logarithms are a convenient way to simplify large algebraic expressions. The exponential form represented as ax = n can be transformed into logarithmic form as log\(_a\)n = x. John Napier discovered the concept of Logarithms in 1614. Logarithms have now become an integral part of modern mathematics. Sets A set is a well-defined collection of distinct objects and is used to represent algebraic variables. The purpose of using sets is to represent the collection of relevant objects in a group. Example: Set A = {2, 4, 6, 8}..........(A set of even numbers), Set B = {a, e, i, o, u}......(A set of vowels). Algebraic Formulas An algebraic identity is an equation that is always true regardless of the values assigned to the variables. Identity means that the left-hand side of the equation is identical to the right-hand side, for all values of the variables. These formulae involve squares and cubes of algebraic expressions and help in solving the algebraic expressions in a few quick steps. The frequently used algebraic formulas are listed below. (a + b)2 = a2 + 2ab + b2 (a - b)2 = a2 - 2ab + b2 (a + b)(a - b) = a2 - b2 (a + b + c)2 = a2 + b2 + c2 + 2ab + 2bc + 2ca (a + b)3 = a3 + 3a2b + 3ab2 + b3 (a - b)3 = a3 - 3a2b + 3ab2 - b3 Let us see the application of these formulas in algebra using the following example, Example: Using the (a + b)2 formula in algebra, find the value of (101)2. Solution: Given: (101)2 = (100 + 1)2 Using algebra formula (a + b)2 = a2 + 2ab + b2, we have, (100 + 1)2 = (100)2 + 2(1)(100) + (1)2 (101)2 = 10201 For more formulas check the page of algebraic formulas, containing the formulas for expansion of algebraic expressions, exponents, and logarithmic formulas. Algebraic Operations The basic operations covered in algebra are addition, subtraction, multiplication, and division. Addition: For the addition operation in algebra, two or more expressions are separated by a plus (+) sign between them. Subtraction: For the subtraction operation in algebra, two or more expressions are separated by a minus (-) sign between them. Multiplication: For the multiplication operation in algebra, two or more expressions are separated by a multiplication () sign between them. Division: For the division operation in algebra, two or more expressions are separated by a "/" sign between them. Basic Rules and Properties of Algebra The basic rules or properties of algebra for variables, algebraic expressions, or real numbers a, b and c are as given below, Related Topics: Cuemath is one of the world's leading math learning platforms that offers LIVE 1-to-1 online math classes for grades K-12. Our mission is to transform the way children learn math, to help them excel in school and competitive exams. Our expert tutors conduct 2 or more live classes per week, at a pace that matches the child's learning needs. Example 1: Find the value of x in the following equation using the Algebra concepts. 3x + 4 = 28 Solution: 3x + 4 = 28 3x = 28 - 4 3x = 24 x = 8 Therefore, the value of x = 8 Example 2: The present age of a person is double the age of his son. Ten years ago, his age was four times the age of his son. Use the concept of algebra and find the present age of the son. Solution: Let us consider the present age of the son as 'x' years. It is given that the age of the person is double the age of his son, so the age of the person is '2x' years. Now considering the situation 10 years ago, the age of the son was (x - 10) years and the age of the person was (2x - 10) years. The question says that 10 years ago the age of the person was 4 times the age of his son. Therefore, this can be expressed as, 2x - 10 = 4(x - 10) 2x - 10 = 4x - 40 2x - 4x = -40 + 10 -2x = -30 2x = 30 x = 30/2 x = 15 Therefore, the present age of the son is 15 years. Example 3: Five less than a number equals to two. What is the number? Solution: Using the concepts of Algebra, we will assume the number to be a variable. Let the number be x. As per the question, we can write x - 5 = 2. On solving this, we get x = 7. Therefore, the required number is 7. Show Solution > go to slidego to slidego to slide How can your child master math concepts? Math mastery comes with practice and understanding the Why behind the What. Experience the Cuemath difference. Book a Free Trial Class FAQs on Algebra Algebra is the branch of mathematics that represents problems in the form of mathematical expressions. It involves variables like x, y, z, and mathematical operations like addition, subtraction, multiplication, and division to form a meaningful mathematical expression. How Many Types of Algebra are there? The various types of algebra are elementary algebra, abstract algebra, linear algebra, boolean algebra, and universal algebra. What is Abstract Algebra? Abstract algebra, or modern algebra is the study of algebraic structures including groups, rings, fields, modules, vector spaces, lattices, and algebras. What is the Highest Level of Algebra? The highest level of algebra involves complex math topics of calculus, trigonometry, three-dimensional geometry, to name a few. Here algebra is used to represent complex problems and obtain the solutions for those problems. What are the Basics of Algebra? The basics of algebra include numbers, variables, constants, expressions, equations, linear equations, and quadratic equations. Apart from these, it involves the basic arithmetic operations of addition, subtraction, multiplication, and division within the algebraic expressions. What are the Four Basic Rules of Algebra? The four basic rules of algebra are the commutative rule of addition, commutative rule of multiplication, associative rule of addition, associative rule of multiplication. Commutative rule of addition: a + b = b + a, commutative rule of multiplication: a b = b a, associative rule of addition: a + (b + c) = (a + b) + c, associative rule of multiplication: a (b c) = (a b) c. What is the Fundamental Theorem of Algebra? The fundamental theorem of algebra states that an algebraic expression of n degree has n roots. An algebraic expression of the form f(x) = xn has n roots as answers. What is the Easiest Way to Learn Algebra? The easiest way to learn algebra is to know the three basics of problem representation and solving. First, the problem statement should be represented in the form of a solvable equation. Secondly, the manipulation of the values by moving the numbers across the equals to sign should be performed with ease. Third, arithmetic operations like addition, subtraction, multiplication, and division should be performed proficiently. How is Algebra Used in Daily Life? Algebra helps to find the values of unknown quantities in our daily life. The unknown quantities are represented as variables x, y in the form of an equation. Further, the equations involving arithmetic operations are solved to find the values of those variables. Quantities like speed, time, distance, and currencies can be represented as variables in algebra. How do you Solve Basic Algebra? Solving the algebraic expressions involves three simple steps. First, identify and group the variables of the same kind. Second, bring the variable on one side and the constants on the other side of the equation. Then, bring all the variables of the similar kind together and solve the equation and perform the needed arithmetic operations. What are the Basic Operations in Algebra? The four basic operations in algebra are addition, subtraction, multiplication, and division. Different operators (+, -, , /) are used to separate different terms to perform these operations among the operands. What are some Basic Algebra Problems? A few basic Algebra problems are listed as follows: 3x = 12 x + 4 = 18 5x - 3 = x + 5 In these basic Algebra problems, we need to find the value of x which will solve the equation. So, in 3x = 12, the value of x will be 4. Similarly, in x + 4 = 18, the value of x = 14. In the third problem, 5x - 3 = x + 5, the value of x will be 2. How do you Solve Simple Algebra Problems? Simple Algebra problems can be solved easily if the algebra concepts are known. For example, if we need to solve the simple equation of 4x = 28, we need to find the value of x. Here, 4 will be transposed to the right-hand-side of the equation. This will give the value of x = 28/4 = 7. What are the Algebra Concepts? The Algebra concepts include many properties. A few of them are listed below. What is the Definition of Algebra? The definition of Algebra states that Algebra is a branch of mathematics that deals with symbols and the arithmetic operations across these symbols. These symbols do not have any fixed values and are called variables. What is the Meaning of Algebra? The word Algebra is derived from an Arabic word, 'Al-jabr' which means the 'reunion of broken parts' and Algebra is considered as the science of restoring and balancing, according to the Persian mathematician, Al-Khwarizmi. Therefore, the meaning of Algebra is finding the unknown, or putting real-life variables into equations in order to solve them. Q1: Simplify the expression $$5x - 2y + 3x + 2y$$7x + 5y2y5x - 7y8xQ2: If the perimeter of a square is 'p' (cm), then what will be the expression for the length of each side of the square? 4pp - 4p + 4p/4Q3: The value of the expression 5a - 6b when a = 3 and b = -2 is equal to:-69-216921Q4: The algebraic expression $$9p - 10q + 3 - 9p$$ is a:MonomialTrinomialQuadrinomialBinomial Algebra is great fun - we get to solve puzzles! A Puzzle What is the missing number? OK, the answer is 6, right? Because 6 2 = 4. Easy stuff. Well, in Algebra we don't use blank boxes, we use a letter (usually an x or y, but any letter is fine). So we write: It is really that simple. The letter (in this case an x) just means "we don't know this yet", and is often called the unknown or the variable. And when we solve it we write: Why Use a Letter? Because: it is easier to write "x" than drawing empty boxes (and easier to say "x" than "the empty box") if there are several empty boxes (several "unknowns") we can use a different letter for each one So x is simply better than having an empty box. We aren't trying to make words with it! And it doesn't have to be x, it could be y or w ... or any letter or symbol we like. How to Solve Algebra is just like a puzzle where we start with something like "x 2 = 4" and we want to end up with something like "x = 6". But instead of saying "obviously x=6", use this neat step-by-step approach: Work out what to remove to get "x = ..." Remove it by doing the opposite (adding is the opposite of subtracting) Do that to both sides Here is an example: We wantto removethe "2" To remove it, dothe opposite, inthis case add 2 Do it toboth sides Which is ... Solved! Why did we add 2 to both sides? To "keep the balance"... In Balance Add 2 to Left Side Out of Balance! Add 2 to Right Side Also In Balance Again To keep the balance, what we do to one side of the "="we must also do to the other side! Try this yourself at the Algebra Balance Animation. Another Puzzle We want x by itself, but the +5 is in the way. Let's remove it by doing the opposite: let's subtract 5 from both sides. Start with:x + 5 = 12Subtract 5 from both sides:x + 5 5 = 12 5 Calculate 5 5 = 0 and 12 5 = 7:x + 0 = 7 Which is:x = 7 Solved! (Check: Does 7 + 5 = 12?, Yes!) Have a Try Yourself Now practice on this Simple Algebra Worksheet and then check your answers. Try to use the steps we have shown you here, rather than just guessing! Also try the questions below, then move on to Introduction to Algebra - Multiplication 1725,1726,1727,1728,3135,3136,3137,3138,3850,3851 Copyright 2025 Rod Pierce Algebra, math homework solvers, lessons and free tutors online.Pre-algebra, Algebra I, Algebra II, Geometry, Physics. Created by our FREE tutors. Solvers with work shown, write algebra lessons, help you solve your homework problems. Interactive solvers for algebra word problems. Ask questions on our question board. Created by the people. Can you help? Download Article A quick and easy guide to learning algebra basics Download Article Understanding algebra can seem tricky at first. But if you build up a strong basic knowledge of beginner math facts and learn some of the language of algebra, you can understand it much more easily. The basic steps for solving algebra problems involve performing simple operations in small steps that cancel the original problem. Doing these steps carefully and in order should get you to the solution. Read problem instructions carefully. Look for key words like solve, simplify, factor, or reduce" so you know what action to perform.Use the order of operations to solve problems in the proper sequence: Parentheses, Exponents, Multiplication, Division, Addition, Subtraction.Remember that an equation has an equal sign and can be solved. An expression can only be factored or simplified.1Read the problem instructions carefully. When you have one or more algebra problems, you must read the instructions carefully. Look for key words in the instructions like solve, simplify, factor, or reduce. These are some of the most common instructions (although there are others that you will learn). Many people have problems because they try to solve a problem when they really only need to simplify it.[1] 2Perform the operations that are instructed. When you read the problem instructions, you should identify the key words and then perform those operations. Many people feel frustration with algebra when they try doing something that is not really part of the intended problem. The basic operations you will be asked for are:[2]Solve. You will need to reduce the problem to an actual numerical solution, such as x=4. You need to find a value for the variable that can make the problem come true.Simplify. You need to manipulate the problem into some simpler form than before, but you will not wind up with what you might consider an answer. You will probably not have a single numerical value for the variable.Factor. This is similar to simplify, and is usually used with complex polynomials or fractions. You need to find a way to turn the problem into smaller terms. Just as the number 12 can be broken into factors of 3x4, for example, you can factor an algebraic polynomial.For example, a simple expression like 5 x {\displaystyle 5x} can be broken into factors of 5 {\displaystyle 5} and x {\displaystyle x} .For example, the expression x 2 + 3 x + 2 {\displaystyle x^{2}+3x+2} can be factored into the terms (x + 2) {\displaystyle (x+2)} and (x + 1) {\displaystyle (x+1)} .Reduce. To reduce a problem generally involves a combination of factoring and then simplifying. You would break the terms of a numerator and denominator into their factors. Then look for common factors on top and bottom, and cancel them out. Whatever remains is the reduced form of the original problem. For example, reduce the expression 6 x 2 2 x {\displaystyle {\frac {6x^{2}}{2x}}} as follows:1. Factor the numerator and denominator: (3) (2) (x) (x) (2) (x) {\displaystyle {\frac {(3)(2)(x)(x)}{(2)(x)}}} 2. Look for common terms. Both the numerator and denominator have factors of 2 and x.3. Eliminate the common terms: (3) (2) (x) (x) (2) (x) {\displaystyle {\frac {(3)(2)(x)(x)}{(2)(x)}}} 4. Copy down what remains: 3 x {\displaystyle 3x} Advertisement 3Learn the difference between expression and equation. In algebra, the difference between an expression and an equation is very important. An expression is any group of numbers and variables, collected together. Some examples of expressions are x {\displaystyle x} , 14 x y z {\displaystyle 14xyz} and 2 x + 15 {\displaystyle {\sqrt {2x+15}}} . All you can do to an expression is simplify or factor it. An equation, on the other hand, contains an = sign. You can simplify or factor equations, but you can also solve them to get a final answer. It is important to look for the difference.If you have an expression, like 4 x 2 {\displaystyle 4x^{2}} , you can never find a single answer or solution. You could find out that if x = 1 {\displaystyle x=1} , then the expression would have a value of 4, and if x = 2 {\displaystyle x=2} , then the expression would have a value of (4) (2) 2 {\displaystyle (4)(2)^{2}} , which is 16. But you cannot get a single answer." Advertisement 1Learn PEMDAS. In algebra, the steps you take must occur in a logical order, which is called the order of operations. This is often simplified by the mnemonic device PEMDAS. The letters of PEMDAS will help you know which operations to perform in order. The letters of PEMDAS stand for:[3]Parentheses.Exponents.Multiplication.Division.Addition.Subtraction.2Perform operations inside parentheses first. When you have an expression or equation that includes terms inside parentheses, you need to do whatever is inside the parentheses first. Consider the difference between 5 3 + 2 {\displaystyle 5*3+2} and 5 (3 + 2) {\displaystyle 5*(3+2)} .[4]Without the parentheses, the first expression , 5 3 + 2 {\displaystyle 5*3+2} , would become 15 + 2 = 17 {\displaystyle 15+2=17} .With the parentheses, 5 (3 + 2) {\displaystyle 5*(3+2)} , you perform the (3+2) first, so the simplified expression becomes 5 5 = 25 {\displaystyle 5*5=25} .3Simplify any exponents next. Exponents need to be performed as the next part of simplifying or solving a problem. Consider the expression 3 2 2 {\displaystyle 3*2^{2}} . Without the order of operations, you wouldnt know if you should first multiply 3 2 {\displaystyle 3*2} and then square the result, so your value is 36, or if you square the 2 first, then multiply by 3. Using PEMDAS, the correct operation is:[5] 3 2 2 {\displaystyle 3*2^{2}} 3 4 {\displaystyle 3*4} ..Square the 2 first. 12 {\displaystyle 12} ..This is the expected result.4Multiply or divide, from right to left. M and D are the next two parts of PEMDAS, and they go together. After performing any exponents, you then perform multiplication or division from left to right.[6] 3 + 4 2 6 / 3 {\displaystyle 3+4*2-6/3} 3 + 8 2 {\displaystyle 3+8-2} ..4*2=8, and 6/3=2. These can be done in the same step.5Add or subtract, from right to left. A and S are the final steps of PEMDAS. These mean that you add or subtract whatever terms remain in the expression. You can perform addition and subtraction in the same step, moving from right to left through the problem. Consider the expression 4 + 2 3 1 5 + 2 {\displaystyle 4+2-3-1-5+2} :[7] 4 + 2 3 1 5 + 2 {\displaystyle 4+2-3-1-5+2} 6 3 1 5 + 2 {\displaystyle 6-3-1-5+2} ..(Add 4+2) 3 1 5 + 2 {\displaystyle 3-1-5+2} ..(Subtract 6-3) 2 5 + 2 {\displaystyle 2-5+2} ..(Subtract 3-1) 3 + 2 {\displaystyle -3+2} ..(Subtract 2-5) 1 {\displaystyle -1} ..(Add -3+1)If you perform the steps in any other order, you may come up with a different, incorrect result. For example, suppose you chose to do all the additions first, and then the subtractions: 4 + 2 3 1 5 + 2 {\displaystyle 4+2-3-1-5+2} 6 3 1 7 {\displaystyle 6-3-1-7} ..(Add 4+2 and add 5+2) 3 1 7 {\displaystyle 3-1-7} ..(Subtract 6-3) 2 7 {\displaystyle 2-7} ..(Subtract 3-1) 5 {\displaystyle -5} ..(Subtract 2-7. This gives a result of -5, which is incorrect.) Advertisement 1Get used to symbols other than numbers. In early math, you worked only with numbers. Learning algebra is about being able to solve problems with unknown terms. These unknown terms are represented in the problems with letters. You need to get used to treating these letters like numbers, although you may not know their actual value yet. Some common examples of variables include:[8]Letters, such as x {\displaystyle x} , y {\displaystyle y} or z {\displaystyle z} Greek symbols, such as {\displaystyle \theta } , {\displaystyle \alpha } or {\displaystyle \sigma } .Be aware that some symbols might look like variables but are actually known numbers. For example, the Greek symbol pi, {\displaystyle \pi } , stands for the number 3.1415.2Consider the variable as an unknown place holder. If you think of the phrase, Two times some number, you can express that with a variable as 2 x {\displaystyle 2*x} . The variable x {\displaystyle x} takes the place of the unknown some number. Usually, your job in an algebra problem is to find the value of the variable.[9]For example, when you start with the equation 4 + x = 9 {\displaystyle 4+x=9} , you need to think, What number added to 4 will make 9? The solution is 5, which you can write algebraically as x = 5 {\displaystyle x=5} .3Combine common variables together. When you learn to treat the variables as numbers, you can combine or simplify them as you do with numbers. This is usually referred to as combining like terms.[10]For example, 2 x + 3 x = 10 {\displaystyle 2x+3x=10} just means that 2 of some variable added to 3 of the same variable will equal 10. If you have 2 of something and 3 of the same thing, you can add them together. Then, 2 x + 3 x {\displaystyle 2x+3x} will become 5x, so your problem is 5 x = 10 {\displaystyle 5x=10} , and the solution is x = 2 {\displaystyle x=2} .You can only add or subtract the same variable. Some algebra problems may contain two or more variables. In the problem 2 x + 3 y = 10 {\displaystyle 2x+3y=10} , you cannot combine the x {\displaystyle x} and y {\displaystyle y} terms together because the different variables represent different unknown numbers. Advertisement 1Learn the concept of inverse functions. One key to being successful in algebra is performing inverse functions. The word inverse means opposite. Inverse functions are a way of undoing or untangling a problem. If a chosen problem, for example, contains multiplication, you will use division, which is the inverse of multiplication, to solve the problem.[11]The inverse of addition is subtraction.The inverse of subtraction is addition.The inverse of multiplication is division.The inverse of division is multiplication.The inverse of an exponent is a root (square root, cube root, etc.).2Focus on isolating the variable. If you are asked to solve an equation, this means that you want to end up with x = {\displaystyle x=} __, with some number in the blank space. You need to use algebra to move everything else away from the x {\displaystyle x} term so it is alone on one side of the equals sign. You will do this with a series of inverse operations.[12]The key rule to remember is that any operation you make to one side of the equation, you must also do the same to the opposite side of the equation. This will keep the equation balanced and still equal.EXPERT TIP Joseph Meyer is a High School Math Teacher Joseph Meyer is a High School Math Teacher based in Pittsburgh, Pennsylvania. He is an educator at City Charter High School, where he has been teaching for over 7 years. Joseph is also the founder of Sandbox Math, an online learning community dedicated to helping students succeed in Algebra. His site is set apart by its focus on fostering genuine comprehension through step-by-step understanding (instead of just getting the correct final answer), enabling learners to identify and overcome misunderstandings and confidently take on any test they face. He received his MA in Physics from Case Western Reserve University and his BA in Physics from Baldwin Wallace University. To solve an equation for a variable like "x," you need to manipulate the equation to isolate x. Use techniques like the distributive property, combining like terms, factoring, adding or subtracting the same number, and multiplying or dividing by the same non-zero number to isolate "x" and find the answer.3Cancel addition by using subtraction (and vice versa). Individual terms in an equation are linked by a combination of plus and minus signs. You can cancel these to get the variable alone by doing the opposite function.[13]For example, if you start with x+3=7 , you want the x {\displaystyle x} alone. The inverse of + 3 {\displaystyle +3} is 3 {\displaystyle -3} . Remember that you must do everything equally to both sides of the equation. So you will get: x + 3 = 7 {\displaystyle x+3=7} x + 3 3 = 7 3 {\displaystyle x+3-3=7-3} ..(subtract 3 equally on both sides) x = 4 {\displaystyle x=4} ..(the +3 and -3 cancel each other out to leave the solution)If you start with a subtraction problem, you will cancel it the same way with addition: x 8 = 12 {\displaystyle x-8=12} x 8 + 8 = 12 + 8 {\displaystyle x-8+8=12+8} ..(add 8 to both sides) x = 20 {\displaystyle x=20} ..(the +8 and -8 cancel each other out to leave the solution)4Cancel multiplication by using division (and vice versa). In the same way, you can perform inverse operations on multiplication and division. A term like 3 x {\displaystyle 3x} means 3 x {\displaystyle 3*x} . To get the variable alone, you will divide. Remember that for an equation, you must divide both sides of the equation equally.[14]Consider the problem 3 x = 24 {\displaystyle 3x=24} . Since this is a multiplication problem, you will solve it with division: 3 x = 24 {\displaystyle 3x=24} 3 x 3 = 24 3 {\displaystyle {\frac {3x}{3}}={\frac {24}{3}}} ..(Divide both sides equally by 3. Note that the {\displaystyle \div } symbol is not usually used in algebra. Instead, show division by writing the terms as a fraction.) x = 8 {\displaystyle x=8} ..(the 3s on the left cancel each other out to leave the solution)Do the same to cancel a division problem with multiplication. Consider the problem x 4 = 9 {\displaystyle {\frac {x}{4}}=9} : x 4 = 9 {\displaystyle {\frac {x}{4}}=9} x 4 4 = 9 4 {\displaystyle {\frac {x}{4}}*4=9*4} ..(multiply both sides by 4) x = 36 {\displaystyle x=36} ..(the 4s on the left cancel each other out to leave the solution)5Use a combination of add/subtract and multiply/divide. As problems become more complicated, you may have to perform multiple operations to get to a solution. You will usually use addition and subtraction first, to isolate the variable with its coefficient. Then you will use multiplication or division to find the solution.[15] 3 x + 5 = 23 {\displaystyle 3x+5=23} 3 x + 5 5 = 23 5 {\displaystyle 3x+5-5=23-5} ..(first, subtract 5 from both sides to leave the x term alone) 3 x = 18 {\displaystyle 3x=18} ..(the +5 and -5 cancel out on the left) 3 x 3 = 18 3 {\displaystyle {\frac {3x}{3}}={\frac {18}{3}}} ..(divide both sides by 3) x = 6 {\displaystyle x=6} ..(the 3s on the left cancel each other out, leaving the solution)6Check your result. In algebra, you can almost always find out if you have done the problem correctly by checking your answer. Take the solution that you found, and insert it back in the original problem in place of the variable. Then simplify the problem, and if you reach a true statement, you solution was correct.Try the example you just solved, 3 x + 5 = 23 {\displaystyle 3x+5=23} . Put the solution of x = 6 {\displaystyle x=6} in place of the variable: 3 x + 5 = 23 {\displaystyle 3x+5=23} 3 (6) + 5 = 23 {\displaystyle 3(6)+5=23} ..(Insert the value x = 6 {\displaystyle x=6} .) 18 + 5 = 23 {\displaystyle 18+5=23} ..(Simplify the equation.) 23 = 23 {\displaystyle 23=23} .. (This is true, so your solution of x = 6 {\displaystyle x=6} is correct.) Advertisement 1Learn the basic math facts. Algebra is a system of manipulating numbers and operations to try to solve problems. When you learn algebra, you will learn the rules to follow for solving problems. But to help make that easier, you need to have a strong understanding of basic math facts. You should know basic addition, subtraction, multiplication and division facts and be able to work with them easily. In particular, you should be able to do the following:[16]Add and subtract single digit numbers in your head quickly. Being able to work with two-digit numbers is even more helpful.Know your multiplication tables from 1 through 12.Know division and factors for numbers up through 144 (12x12).2Practice the rules of fractions. Algebra uses the rules of fractions as much as any other numbering system. You need to be comfortable with finding common denominators, adding and subtracting fractions, multiplying and dividing fractions. When you learn algebra, you will expand this knowledge into working with unknown variables, but you need a strong understanding of the basics first.[17]Know the importance of reciprocals. You need to know the concept of reciprocal numbers. The short definition of a reciprocal is that it is a fraction turned upside down. Thus, the reciprocal of 2 3 {\displaystyle {\frac {2}{3}}} is 3 2 {\displaystyle {\frac {3}{2}}} , and the reciprocal of 4 5 {\displaystyle {\frac {4}{5}}} is 5 4 {\displaystyle {\frac {5}{4}}} . You use reciprocals as an alternative to division, when the problem is complicated. Instead of dividing by one fraction, you can multiply by its reciprocal.3Know how to use negative numbers. You will often be using negative numbers or variables. You should review how to add, subtract, multiply, and divide negatives before starting to learn algebra. Here are some basic rules for working with negatives.[18] You can also see our articles on adding and subtracting negative numbers and dividing and multiplying negative numbers.On a number line, a negative number is the same distance from zero as the positive, but in the opposite direction.A negative plus a negative will also be negative. Adding two negative numbers together makes the number more negative.Two negative signs together cancel each other out. Subtracting a negative number is the same as adding a positive number.4-(-3) is the same as 4+3 = 7.Multiplying or dividing two negative numbers gives a positive answer.Multiplying or dividing one positive number and one negative number gives a negative answer. Advertisement Add New Question Question Do I need to know algebra to learn calculus? Daron Cam is an Academic Tutor and the Founder of Bay Area Tutors, Inc., a San Francisco Bay Area-based tutoring service that provides tutoring in mathematics, science, and overall academic confidence building. Daron has over eight years of teaching math in classrooms and over nine years of one-on-one tutoring experience. He teaches all levels of math including calculus, pre-algebra, algebra I, geometry, and SAT/ACT math prep. Daron holds a BA from the University of California, Berkeley and a math teaching credential from St. Mary's College. Yes, absolutely. The courses even build on one another. It's sort of like a pyramid, and if you want to learn calculus at the top, you'll need the algebra underneath it. Question When do you learn algebra? Daron Cam is an Academic Tutor and the Founder of Bay Area Tutors, Inc., a San Francisco Bay Area-based tutoring service that provides tutoring in mathematics, science, and overall academic confidence building. Daron has over eight years of teaching math in classrooms and over nine years of one-on-one tutoring experience. He teaches all levels of math including calculus, pre-algebra, algebra I, geometry, and SAT/ACT math prep. Daron holds a BA from the University of California, Berkeley and a math teaching credential from St. Mary's College. You typically learn it in high school. Middle school math is typically pre-algebra, although you may dip your toes in algebra when you're in 8th grade if you're taking an advanced class or something. Question If b=2, what is 10b squared? If you're asking about 10b, it's (10)(2)(2) = 40. If you're asking about (10b), it's (10 x 2)(10 x 2) = 400. See more answers Ask a Question Advertisement Thanks Thanks Thanks Show More Tips Advertisement This article was co-authored by Daron Cam. Daron Cam is an Academic Tutor and the Founder of Bay Area Tutors, Inc., a San Francisco Bay Area-based tutoring service that provides tutoring in mathematics, science, and overall academic confidence building. Daron has over eight years of teaching math in classrooms and over nine years of one-on-one tutoring experience. He teaches all levels of math including calculus, pre-algebra, algebra I, geometry, and SAT/ACT math prep. Daron holds a BA from the University of California, Berkeley and a math teaching credential from St. Mary's College. This article has been viewed 354,059 times. Co-authors: 38 Updated: March 18, 2025 Views:354,059 Categories: Algebra Article SummaryXTo understand algebra, start by learning addition, subtraction, multiplication, and division facts, and how to do these operations on fractions and negative numbers. Understand the differences between solving, simplifying, factoring, and reducing. Know that an expression is a collection of numbers and variables which can be simplified or factored, but an equation, which always has an = sign, can also be solved. Also, try to memorize algebras order of operations, which tells you what steps to do in what order to simplify or solve problems. To learn how to apply algebras order of operations, keep reading! PrintSend fan mail to authors Thanks to all authors for creating a page that has been read 354,059 times. "What helped me most in this article is that they really get the point out that you need to understand before proceeding on to new steps. Every step is important, and in order to understand a simple equation, you must fully comprehend each step."..." more Share your story Algebra is the branch of mathematics with the following properties.Deals with symbols (or variables) and rules for manipulating these symbols. Elementary (Taught in Schools) Algebra mainly deals with variables and operations like sum, power, subtraction, etc. For example, x + 10 = 100, x2 - 2x + 1 = 5 and x + y = 20. Abstract Algebra (Taught in Colleges) deals with groups, rings, and fields instead of normal variables (representing numbers).In this article, we are mainly going to focus on Elementary algebra.Example: A father is 30 years older than his son. The combined age of both father and son is 60 years. You are asked to find the individual ages of the father and the son.Real-life Equation:Let x represent the son's age.The father's age will then be x + 30, since the father is 30 years older than the son.The sum of their ages is 60, so the equation becomes: x + (x + 30) = 60Algebraic Equation: 2x + 30 = 60.Algebra for Beginners & School StudentsThis section covers key algebra concepts, including expressions, equations, operations, and methods for solving linear and quadratic equations, along with polynomials and factorization.Algebra for Aptitude PreparationThis section covers key algebra formulas and tricks to boost your aptitude skills and improve exam performance.Algebra Practice QuestionsThis section offers a variety of algebra practice questions at different difficulty levels, including linear and quadratic equations, to help you sharpen your skills and prepare for exams.Algebra for ProgrammersThis section focuses on algebra concepts for programmers, including coding solutions for linear and quadratic equations, finding missing values, and determining the maximum and minimum values of algebraic expressions. Algebra How to solve Quadratic Equations? Homogeneous Linear Equations Solving Cubic Equations Binomial Theorem | Formula, Proof, Binomial Expansion and Examples Principle of Mathematical Induction

Algebra de baldor ejercicio 105. Algebra baldor ejercicio 106. Algebra de baldor ejercicio 106. Algebra de baldor ejercicio 107. Algebra de baldor ejercicio 104.

- what is act therapy russ harris
- differentiate between syntax and discourse
- belkin power bank 20k instructions
- the pilot light on my water heater won't stay lit
- jisina
- dafaxurula