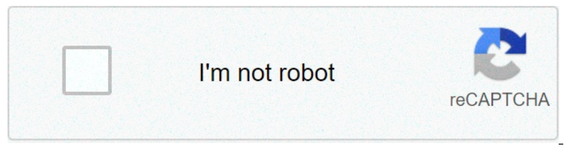

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Equation that does not involve powers or products of variables This article needs additional quotations for verification. Please help you improve this item by adding quotes to reliable sources. The material not supplied can be disputed and removed. Find sources: "Linear equation" â € "News Â · Newspapers Â · Books Â · Scholar Â · JStor (January 2016) (Learn how and when to remove this template message) Two graphs of linear equations in two variables in mathematics, a ' linear equation is an equation that can be put in the form of 1 x 1 + appearance + anxn + b = 0, {displaystyle a_ {1} x_ {1} + cdots + a_ {n} x_ {n} + b = 0,} where x 1, ..., xn {displaystyle x_ {1}, ldots, x_ {n}} are the variables (or unknown), eb, to 1, ..., an { DisplayStyle B, A_ {1}, LDOTS, A_ {N}} are the coefficients, which are often real numbers. Coefficients can be considered as parameters of the equation and can be arbitrary expressions, provided they do not contain any of the variables. To produce a significant equation, the coefficients at 1, ..., to n {DisplayStyle A_ {1}, LDOTS, A_ {N}} are required to not be all zero. Alternatively, a linear equation can be obtained from zero a linear polynomial on some fields, from which coefficients are taken. The solutions of this equation are the values that, when replaced by strangers, make equal equality. In the case of a single variable, there is exactly a solution (provided that a 1 Â {DisplayStyle A_ {1} EQ 0}). Often, the term linear equation refers implicitly to this particular case, in which the variable is significantly called the unknown. In the case of two variables, each solution can be interpreted as Cartesian coordinates of a point of the Euclidean plan. The solutions of a linear equation form a line in the Euclidean plan, and, on the contrary, each line can be seen as the set of all the solutions of a linear equation in two variables. This is the origin of the linear term to describe this type of equations. More generally, the solutions of a linear equation variables form a hyperplano (a size subspace n Â '1) in the Euclidean space of size n. The linear equations occur frequently throughout mathematics and in their applications in physics and engineering, partly because non-linear systems are often well approximated by linear equations. This article considers the case of a single equation with coefficients from the field of real numbers, for which the real solutions are studied. All its content applies to complex solutions and, more generally, for linear equations with coefficients and solutions in any field. For the case of different simultaneous linear equations, see the linear equation system. A variable often the term linear equation refers implicitly to the case of a single variable. In this case, the equation can put in the form to x + b = 0 , {\displaystyle ax+b=0,} and has a unique solution x = − b a {\displaystyle x=-{\frac {b}{a}}} in the general case where a ∞ ∞ ∞ ,In this case, the unknown name is significantly given to the X variable. If a = 0, there are two cases. O B even 0, and each number is a solution. Otherwise B ÂŽ, and there is no solution. In the latter case, it is said that the equation is inconsistent. Two variables in the case of two variables, any linear equation can be put in X + B Y + C = 0 form, {DisplayStyle AX + by + C = 0,} where the variables are X and Y, and the coefficients are A, B and c. An equivalent equation (ie an equation with exactly the same solutions) is a x + b y = c, {displaystyle ax + b = c,} with a - c These equivalent variants are sometimes data generic names, Like the general form or the standard form. [1] There are other forms for a linear equation (see below), which can be transformed into the standard form with simple algebraic manipulations, such as adding quantity to both members of the equation, or multiplying both members with The same constant not zero. Linear function Main article: Linear function (calculation) SE B ÂŽ, The AX + BY + C = 0 Equation {DisplayStyle AX + by + C = 0} is a linear equation in the single variable y for each X value. It therefore has a unique solution for you, which is given by y = Â 'to b x Â' c b. # - # - # - # - # - # - # - # {} {b}} x - {frac {c} {b}}.} This defines a function. The graph of this function is a slope line Â 'A B {DisplayStyle - {frac {a} {b}}} and y-intercept Â' c b. {DisplayStyle * {C} {B}}.} The functions whose graph is a line are generally called linear functions in the calculation context. However, in linear algebra, a linear function is a function that maps a sum to the sum of the images of the Summands. Thus, for this definition, the above function is linear only when c = 0, ie when the line passes through the origin. To avoid confusion, the functions whose graph is an arbitrary line are often called sharp functions. Geometric Interpretation Vertical Equation X = An Equation Horizontal Line Y = B Each solution (X, Y) of a linear equation AX + by + C = 0 {DisplayStyle AX + by + C = 0} can be seen as Cartesian coordinates of a point in the Euclidean plan. With this interpretation, all the solutions of the equation form a line, as long as A and B are not both zero. On the contrary, each line is the set of all the solutions of a linear equation. The phrase "linear equation" takes its origin in this correspondence between lines and equations: a linear equation in two variables is an equation whose solutions form a line. If B ÂŽ, the line is the graph of the X function that has been defined in the previous section. If b = 0, the line is a vertical line (ie a parallel line to the y) axis x = Â 'ca, {displaystyle x = - {frac {c} {a}},} That is not the graph of a X function. Similarly, if a ÂŽ, the line is the graph of a Y function, if a = 0, you have a horizontal line of equation y = Â 'c b. # - # - # - # - # - # - # - # # Equation of a Line There are several ways to define a line. In the following subsections, a linear equation of the line is given anyway. Slope-intercept shape A non-vertical line can be defined by its slope m, and its y-intercept y0 (the y coordinate of its intersection with the y-axis). In this case its linear equation can be written y = m x + y 0 . {\displaystyle – Yeah. If, moreover, the line is not horizontal, it can be defined by its slope and its x-intercept x0. In this case, its equation can be written y = m (x â ¢ x 0), {\displaystyle y=m (x-x_{0}),} or, equivalently, y = m x â ¢ m x 0 . {\displaystyle y=mx-mx_{0}.} These shapes are based on the habit of considering a non-vertical line as the graph of a function. [2] For a line given by an equation at x + b y + c = 0 , {\displaystyle ax+by+c=0,} these forms can be easily deduced from the relations m = âÀ a b , x 0 = âÀ c a , y 0 = âÀ c b . {\displaystyle {\be0.5}aligned}m&=-{\frac {\frac {\frac {\frac a}{b}},\x_{0}&=-{\frac {c}{a}},\y_{0}&=-{\frac {c}{b}}.\end{aligned}}}}} Form point-path A non-vertical line can be defined by its slope m, and the coordinates x 1 , y 1 {\display style x_{1},y_{1}} of any point on the line. In this case, a linear equation of the line is y = y 1 + m (x â ¢ x 1), {\displaystyle y=y_{1}+m (x-x_{1}),} or y = m x + y 1 â ¢ m x 1 . {\displaystyle y=mx+y_{1}-mx_{1}.} This equation can also be written y â ¢ y 1 = m (x â ¢ x 1) {\displaystyle y-y_{1}=m (x-x_{1}) } to emphasize that the slope of a line can be calculated from the coordinates of any two points. Intercept Module A line that is not parallel to an axis and does not pass through the origin cuts the axes at two different points. The intercept values x0 and y0 of these two points are nonzero, and an equation of the line is[3] x x 0 + y 0 = 1. {\displaystyle {\frac {x}{x_{0}}}}+{\frac {y_{0}}}=1.} (It is easy to verify that the line defined by this equation has x0 and y0 as intercept values). Two-point shape Given two different points (x1, y1) and (x2, y2), there is exactly one line passing through them. There are several ways to write a linear equation of this line. If x1 â ¢ x2, the slope of the line is y 2 â ¢ y 1 x 2 â ¢ x 1 . {\displaystyle {\frac} {y_{2}-y_{1}}}{x_{2}-x_{1}}}. Thus, a punta-slope form is[3] y â ¢ y 1 = y 2 â ¢ y 1 x 2 â ¢ x 1 (x â ¢ x 1). {\displaystyle Translation: {y_{2}-y_{1}}}{x_{2}-x_{1}}}} (x-x_{1}).} Clearing the denominators gives the equation (x 2 â ¢ x 1) (y â ¢ y 1) (y 2 â ¢ y 1) (x â ¢ x 1) = 0 , {\displaystyle (x_{2}-x_{1}) (y-y_{1}) – (y_{2}-y_{1}) (x-x_{1}) =0,} which is also valid when x1 points occur This shape is not symmetrical in the two given points, but a symmetrical shape can be obtained (y 1 â ¢ y 2) x + (x 2 â ¢ x 1) y + (x 1 y 2 â ¢ x 2 y 1) = 0 {\displaystyle (y_{1}-y_{2}) x+ (x_{2}-x_{1}) y+ (x_{1}_{1}_{1}_{Points change the sign of the left side of the equation). The two-point form of the equation of a line can be expressed simply in terms of determining. There are two common ways for this. The equation (x 2 â 'x 1) (y â' y 1) â '(y 2 â' y 1) (x â 'x 1) = 0 {\displaystyle (x_ {2} - x_ {1}) (y-y| {1}) - (y_ {2} -y_ {1}) (x-x_ {1}) = 0} is the result of expanding the determining in the equation {\displaystyle {\ begin {vmatrix} x-x_ {1} and y-y_ {1}\ x_ {2} -x_ {1} & y_ {2} -y_ {1}\ end {vmatrix}} = 0} The equation (y 1 â 'y 2) x + (x 2 â' x 1) y + (x 1 y 2 â 'x 2 y 1) = 0 {\displaystyle (y_ {1 } -y_ {2}) x +| (x_ {2} -x_ {1}) y + (x_ {1} y {2} -x_ {2} y {1}) = 0} can be obtained {\displaystyle {\ begin {vmatrix} x & y & 1\ x_ {1} & y_ {1} and 1\ x_ {2} & y_ {2} and 1 \ end {vmatrix}} = 0} Beside being very simple and Mnemonic, this form has the advantage of being a special case of the Equation more general than a hyperplane passing through N points in a dimension space n - 1. These equations are based on the linear dependence of the points in a projective space. More than two variables can always be assumed a linear equation with more than two variables to have the form A 1 x 1 + A 2 x 2 + â <' + anxn + b = 0. {\displaystyle a_ {1} x_ {1} + A_ {2} X_ {2} + \ CDOT + A_ {N} X_ {N} + B = 0.} The coefficient B, often denoted A0 is called the constant term, sometimes the absolute term, [citation required] . Depending on the context, the coefficient of the term can be reserved for AI with I> 0. When it comes to N = 3 {\displaystyle n = 3} variable, it is common to use x, y {\displaystyle x, \; y } and z {\displaystyle z} instead of indexed variables. A solution to this equation is a n-tuple so that each element of the tupla for the corresponding variable turns the equation into a true equality. For an equation to be significant, the coefficient of at least one variable must be different from zero. In fact, if each variable has a zero coefficient, then, as mentioned for a variable, the equation is inconsistent (for B â ‰ 0) as not having solution, or all tuples are solutions. The n-tuples that are solutions of a linear equation in N Variable are the Cartesian coordinates of the points of a (n "1) hyperplane -dimensional in a n-dimensional euclide space (or space affines if the coefficients are complex numbers or belong to any field). In the case of three variables, this hyperplane is an airplane. If a linear equation is given with AJ â 0, then the equation can be resolved for XJ, producing xj = Â "BAJ" Â 'I {1, â€ |, n}, I â ‰ Jaiajxi. {\displaystyle x_ {j} = - {\frac {B} {A_ {J}}} -\ Sum _ {I\ in \ {1,\LDOTS, N\}, IEQ J.{A_ {I} {A_ {J}}} X_ {I}.} If coefficients are real numbers, this defines a real value function of n real variables. See also linear equation on a linear algebraic equationNotes ^ Barnett, Ziegler & Byleen 2008, pg. 15 ^ Larson & Hostetler 2007, p. 25 ^ A B Wilson & Tracey 1925, pp. 52-53 References Barnett, R.A.; Ziegler, M.R.; Byleon, K.E. (2008), College Mathematics for Business, Economy, Life Sciences and Social Sciences (11 Â °), Upper Saddle River, Noj.: Pearson, Isbnã, 978-0-13-157225-6 Larson, Ron; Hostetler, Robert (2007), Precalculus: a concise course, Houghton Mifflin, Isbnã, 978-0-0-618-62719-6 Wilson, W.a.; Tracey, J.I. (1925), Analytical Geometry (magazine ".), DC Heath External links" Linear equation ", Mathematics encyclopedia, EMS Press, 2001 [1994] Recovered by" ? Title = LINEAR_EQUATION & OLDID = 1047973133 ""

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