

Glossary

Laptop A small portable computer.

Law of contraposition A conditional may always be replaced by its contrapositive without having its truth value affected.

Law of detachment Same as *direct reasoning*.

Law of double negation $\sim (\sim p) \Leftrightarrow p$

Law of the excluded middle Every simple statement is either true or false.

Laws of exponents There are 5 laws of exponents.

Addition law $b^m \cdot b^n = b^{m+n}$

Multiplication law $(b^n)^m = b^{mn}$

Subtraction law $\frac{b^m}{b^n} = b^{m-n}$

Distributive laws $(ab)^m = a^m b^m$

$$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$$

Laws of logarithms If A , B , and b are positive numbers, p any real number, and $b \neq 1$, then

Addition law $\log_b(AB) = \log_b A + \log_b B$

Subtraction law $\log_b \frac{A}{B} = \log_b A - \log_b B$

Multiplication law $\log_b A^p = p \log_b A$

Laws of square roots There are 4 laws of square roots.

(1) $\sqrt{0} = 0$ (2) $\sqrt{a^2} = a$

(3) $\sqrt{ab} = \sqrt{a}\sqrt{b}$ (4) $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

l.c.d. An abbreviation for least common denominator.

l.c.m. An abbreviation for least common multiple.

Least common denominator (l.c.d.) The smallest number that is exactly divisible by each of the given numbers.

Least common multiple (l.c.m.) The smallest number that each of a given set of numbers divides into.

Least squares line A line $y = mx + b$ so that the sum of the squares of the vertical distances of the data points from this line will be as small as possible.

Least squares method A method based on the principle that the best prediction of a quantity that can be deduced from a set of measurements or observations is that for which the sum of the squares of the deviations of the observed values (from predictions) is a minimum.

Leg of a triangle One of the two sides of a right triangle that are not the hypotenuse.

Length A measurement of an object from end to end.

Less than If a is to the left of b on a number line, then a is less than b , $a < b$. Formally, $a < b$ if and only if $b > a$.

Less than or equal to Written $a \leq b$, means $a < b$ or $a = b$.

Like terms Terms that differ only in their numerical coefficients. Also called *similar terms*.

Limit The formal definition of a limit is beyond the scope of this course. Intuitively, it is the tendency of a function to approach some value as its variable approaches a given value.

Limit of a sequence The formal definition of a limit of a sequence is beyond the scope of this course. Intuitively, it is an accumulation point such that there are an infinite number of terms of the sequence arbitrarily close to the accumulation point.

Limits of integration See *Integral*.

Line In mathematics, it is an undefined term. It is a curve that is straight, so it is sometimes referred to as a *straight line*. It extends in both directions and is considered one-dimensional, so it has no thickness.

Line graph See *Graph*.

Line of credit A preapproved credit limit on a credit account. The maximum amount of credit to be extended to a borrower. That is, it is a promise by a lender to extend credit up to some predetermined amount.

Line of symmetry A line with the property that for a given curve, any point P on the curve has a corresponding point Q (called the reflection point of P) so that the perpendicular bisector of \overline{PQ} is on the line of symmetry.

Line segment A part of a line between two points on the line.

Linear (1) A first-degree polynomial. (2) Pertaining to a line. In two variables, a set of points satisfying the equation
 $Ax + By + C = 0$.

Linear combination method See *Addition method*.

Linear correlation coefficient A measure to determine whether there is a statistically significant linear relationship between two variables.

Linear equation An equation of the form

$$ax + b = 0 \text{ (one variable) or}$$

$$Ax + By + C = 0 \text{ (two variables)}$$

A first-degree equation with one or two variables. For example, $x + 5 = 0$ and $x + y + 5 = 0$ are linear. An equation is linear in a certain variable if it is first-degree in that variable. For example, $x + y^2 = 0$ is linear in x , but not y .

Linear function A function whose equation can be written in the form

$$f(x) = mx + b.$$

Linear inequality A first-degree inequality with one or two variables.

Linear polynomial A first-degree polynomial.

Linear programming A type of problem that seeks to maximize or minimize a function called the *objective function* subject to a set of *restrictions* (linear inequalities) called *constraints*.

Linear programming theorem A linear expression in two variables, $c_1x + c_2y$, defined over a convex set S whose sides are line segments, takes on its maximum value at a corner point of S and its minimum value at a corner point of S . If S is unbounded, there may or may not be an optimum value, but if there is, then it must occur at a corner point.

Linear system A system of equations, each of which is first degree.

Liter The basic unit of capacity in the metric system. It is the capacity of 1 cubic decimeter.

Literal equation An equation with more than one variable.

Logarithm For $A > 0$, $b > 0$, $b \neq 1$

$$x = \log_b A \quad \text{means} \quad b^x = A$$

x is called the logarithm and A is called the argument.

Logarithmic equation An equation for which there is a logarithm on one or both sides.

Logarithmic function

$$f(x) = \log_b x, \quad b > 0, \quad x > 0$$

Logarithmic scale A scale in which logarithms are used to make data more manageable by expanding small variations and compressing large ones.

Logic The science of correct reasoning.

Logical conclusion The statement that follows logically as a consequence of the hypotheses of a theorem.

Logical equivalence Two statements are *logically equivalent* if they have the same truth values.

Logical fallacy An invalid form of reasoning.

Log of both sides theorem If A , B , and b are positive real numbers with $b \neq 1$, then $\log_b A = \log_b B$ is equivalent to $A = B$

Lower quota In apportionment, the result of a quota found by rounding down.

Lowest common denominator For two or more fractions, the smallest common multiple of the denominators. It is the same as the *lowest common multiple*.

Lump-sum problem A financial problem that deals with a single sum of money, called a *lump sum*. Contrast with a *periodic payment* problem.