Glossary

Gallon A measure of capacity in the United States system that is equal to 4 quarts.

Gates In circuit logic, it is a symbolic representation of a particular circuit.

Gauss-Jordan elimination A method for solving a system of equations that uses the following steps. *Step 1*: Select as the first pivot the element in the first row, first column, and pivot. *Step 2*: The next pivot is the element in the second row, second column; pivot. *Step 3*: Repeat the process until you arrive at the last row, or until the pivot element is a zero. If it is a zero and you can interchange that row with a row below it, so that the pivot element is no longer a zero, do so and continue. If it is zero and you cannot interchange rows so that it is not a zero, continue with the next row. The final matrix is called the **row-reduced form.**

g.c.f. An abbreviation for *greatest common factor.*

General form In relation to second-degree equations (or conic sections) it refers to the form

$$Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$$

where A, B, C, D, E, and F are real numbers and (x, y) is any point on the curve.

General term The nth term of a sequence or series.

Genus The number of cuts that can be made without cutting a figure into two pieces. The genus is equivalent to the number of holes in the object.

Geometric mean The geometric mean of the numbers a and b is $\sqrt{ab}$.

Geometric sequence A sequence for which the ratio of each term to the preceding term is a constant, written $g_1, g_2, g_3, \cdots$. The nth term of a geometric sequence is $g_n = g_1 r^{n-1}$, where g_1 is the first term and r is the *common ratio*. It is also called a *geometric progression.*

Geometric series The indicated sum of the terms of a geometric sequence. The sum of n terms is denoted by G_n and

$$G_n = \frac{g_1(1 - r^n)}{1 - r}, r \neq 1$$

If $|r| < 1$, then $G = \frac{g_1}{1 - r}$, where G is the sum of the infinite geometric series. If $|r| \geq 1$, the infinite geometric series has no sum.

Geometry The branch of mathematics that treats the shape and size of things. Technically, it is the study of invariant properties of given elements under specified groups of transformations.

GIGO Garbage In, Garbage Out, an old axiom regarding the use of computers.

Golden ratio The division of a line segment $\overline{AB}$ by an interior point P so that

$$\frac{|\overline{AB}|}{|\overline{AP}|} = \frac{|\overline{AP}|}{|\overline{PB}|}$$

It follows that this ratio is a root of the equation $x^2 - x - 1 = 0$, or $x = \frac{1}{2}(1 + \sqrt{5})$. This ratio is called the golden ratio and is considered pleasing to the eye.

Golden rectangle A rectangle *R* with the property that it can be divided into a square and a rectangle similar to *R*; a rectangle whose sides form a golden ratio.

Googol The number with 1 followed by 100 zeros — that is, 10,000,000,000,000,000,000,000,000,000, 000, 000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000, 000, 000,000,000,000,000,000

Grace period A period of time between when an item is purchased and when it is paid during which no interest is charged.

Gram A unit of weight in the metric system. It is equal to the weight of one cubic centimeter of water at 4°C.

Grant's tomb properties Two fundamental properties of logarithms:

1. $\log_b b^x = x$
2. $b^{\log_b x} = x,\ x > 0$

Graph (1) In statistics, it is a drawing that shows the relation between certain sets of numbers. Common forms are bar graphs, line graphs, pictographs, and pie charts (circle graphs). (2) A drawing that shows the relation between certain sets of numbers. It may be one-dimensional ($\mathbb{R}$), two-dimensional ($\mathbb{R}^2$), or three-dimensional ($\mathbb{R}^3$). (3) A set of vertices connected by arcs or line segments.

Graph of an equation See *Equation of a graph.*

Graphing method A method of solving a system of equations that finds the solution by looking at the intersection of the individual graphs. It is an approximate method of solving a system of equations, and depends on the accuracy of the graph that is drawn.

Great circle A circle on a sphere that has its diameter equal to that of the sphere.

Greater than If *a* lies to the right of *b* on a number line, then *a* is greater than *b*, $a > b$. Formally, $a > b$ if and only if $a - b$ is positive.

Greater than or equal to Written $a \geq b$, means $a > b$ or $a = b$.

Greatest common factor The largest divisor common to a given set of numbers.

Group A set with one defined operation that satisfies the closure, associative, identity, and inverse properties.

Grouped frequency distribution If the data are grouped before they are tallied, then the resulting distribution is called a *grouped frequency distribution.*

Grouping symbols Parentheses ( ), brackets [ ], and braces { } indicate the order of operations and are also sometimes used to indicate multiplication, as in $(2)(3) = 6$. Also called *symbols of inclusion.*

Growth formula Refers to exponential growth. It is described by the equation

$$A = A_0 e^{rt}$$

where *r* is the annual growth rate (and consequently is positive), *t* is the time (in years), A_0 is the amount present initially (present value), and *A* is the future value. If *r* is positive, this formula models growth, and if *r* is negative, the formula models decay.