History of Logarithms

Available online at http://www.sosmath.com/algebra/logs/log1/log1.html

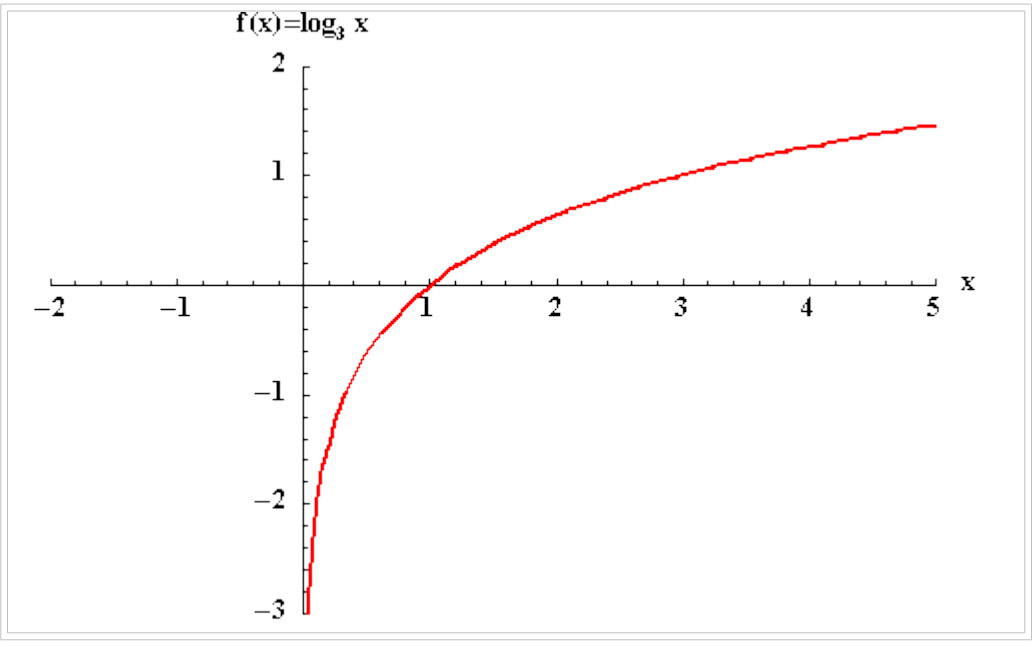
Logarithms were invented independently by John Napier, a Scotsman, and by Joost Burgi, a Swiss. The logarithms which they invented differed from each other and from the common and natural logarithms now in use. Napier's logarithms were published in 1614; Burgi's logarithms were published in 1620. The objective of both men was to simplify mathematical calculations. Napier's approach was algebraic and Burgi's approach was geometric. Neither men had a concept of a logarithmic base. Napier defined logarithms as a ratio of two distances in a geometric form, as opposed to the current definition of logarithms as exponents. The possibility of defining logarithms as exponents was recognized by John Wallis in 1685 and by Johann Bernoulli in 1694.

The invention of the common system of logarithms is due to the combined effort of Napier and Henry Biggs in 1624. Natural logarithms first arose as more or less accidental variations of Napier's original logarithms. Their real significance was not recognized until later. The earliest natural logarithms occur in 1618.

Logarithms are useful in many fields from finance to astronomy.

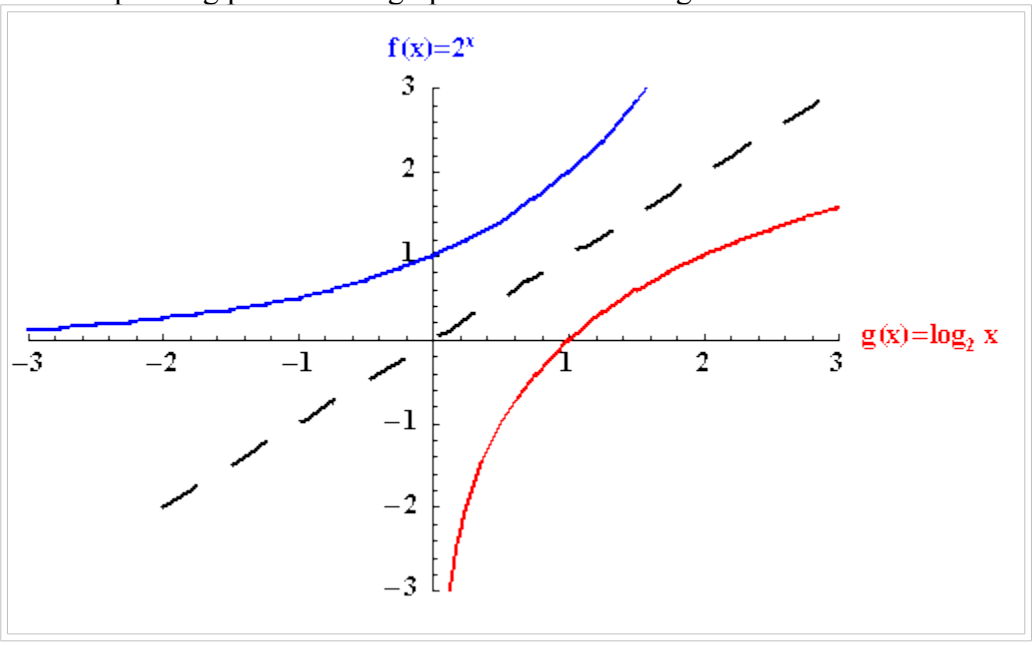
Graphs:

Since $x > 0$, the graph of the above function will be in quadrants I and IV.



Comments on Logarithmic Functions

- The exponential equation $4^3 = 64$ could be written in terms of a logarithmic equation as $\log_4(64) = 3$.
- The exponential equation $5^{-2} = \frac{1}{25}$ can be written as the logarithmic equation $\log_5 \frac{1}{25} = -2$.
- Since logarithms are nothing more than exponents, you can use the rules of exponents with logarithms.
- Logarithmic functions are the inverse of exponential functions. For example if (4, 16) is a point on the graph of an exponential function, then (16, 4) would be the corresponding point on the graph of the inverse logarithmic function.



- The two most common logarithms are called **common** logarithms and **natural** logarithms. Common logarithms have a base of 10, and natural logarithms have a base of *e*.

Applications: Logarithms can be useful in examining interest rate problems, mortgage problems, population problems, radioactive decay problems, earthquake problems, and astronomical problems. Logarithms are useful in any problem where the exponent is unknown.