Logarithms

College Algebra

Main Ideas

- The common logarithm of x is the exponent to which you must raise 10 to get x.
- The natural logarithm of x is the exponent to which you must raise $e = 2.71828\ldots$ to get x.
- There are several applications of logarithms.
- We will use logarithms later in the course to solve exponential functions.

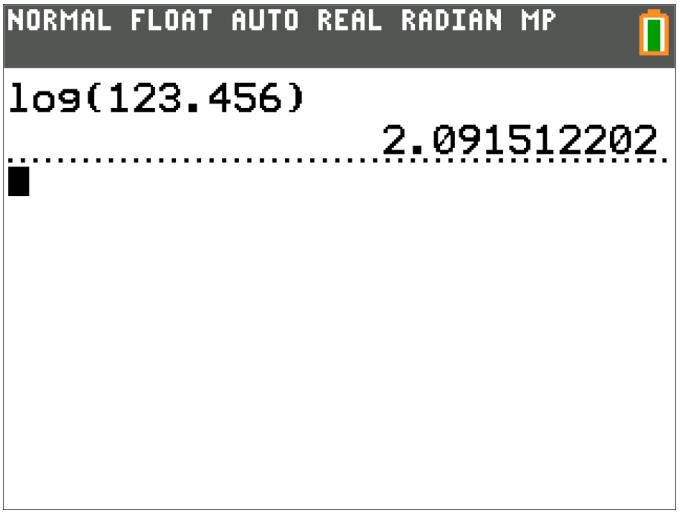
Common Logarithms

Definition – Common Logarithm

For a positive number x, define the common logarithm of x to be $y = \log x$ to be the number where $10^y = x$.

How To – Approximate the Common Logarithm of a Number on a TI Graphing Calculator

Calculate the common logarithm of a number by pressing the `LOG` button followed by the number. Close the parentheses and press `ENTER`.



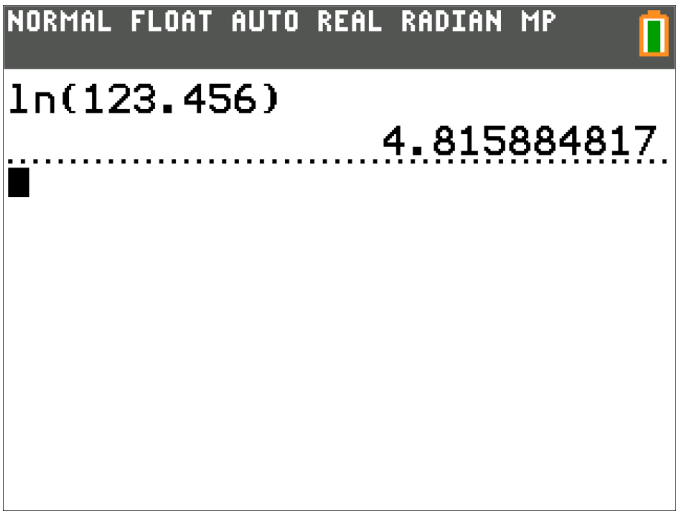
Natural Logarithms

Definition – Natural Logarithm

The number $e = 2.71828\ldots$ is a constant like π in mathematics. For a positive number x, define the **natural logarithm** of x to be $y = \ln x$ to be the number where $e^y = x$.

How To – Approximate the Common Logarithm of a Number on a TI Graphing Calculator

Calculate the natural logarithm of a number by pressing the `LN` button followed by the number. Close the parentheses and press `ENTER`.



Note

The constant e is a number that is useful in Calculus. That is the reason it appears in so many science classes.