Common and Natural Logarithms

Common Logarithms

Logarithms to the base 10 are called common logarithms (presumably because our counting system is base 10 and it's pretty common). So when we write a logarithm statement and there is no base specified, we automatically assume it is in base 10):

$\log(x) = \log_{10}(x)$

Most calculators will have a "log" or "Log" or "LOG" button. This button will give logs in base 10.

Natural Logarithms

As you have already studied, exponents with a base of e occur frequently in the natural world. This means we often encounter functions of the form:

$f(x) = a\,e^{x}$ or $f(x) = a\,e^{-x}$

where $e = 2.71828182846...$

If we go back to our original question using power notation, we could ask:

$\text{power}_e(25) = ?$

This is asking the same thing as:

$\log_e(25) = ?$

Since natural logarithms occur frequently in mathematical analysis, the symbol

$\log_e$

is given its own separate notation:

ln

which is pronounced as "ellen" in the United Stated and as "lawn" in Canada. Regardless of how you like to pronounce things,

$\ln(25) = 3.21888$

On many calculators, the "ln" or "LN" button is more prominent than the "log" or "LOG" button because natural logs are used more commonly than common logs. Go figure.