The Natural Logarithm

The inverse of $y = e^x$ would be the logarithmic function $y = \log_e x$. Because of the significance of *e* in representing the idea of instantaneous growth, $\log_e x$ became known as the ***natural logarithm*** of *x* and was defined as $\ln x$. This is read as the natural log of *x*, log base *e* of *x*, or more simply "lawn" *x*. Alternately, $\log_e x = \ln x$

$\ln e^4 = $ "x"

$e^x = e^4$

$x = 4$

Thus $\ln 1 = 0$ because $e^0 = 1$ and $\ln e^4 =$ 4 because $e^{4} = e^4$.

ln 0 is undefined because $e^{\square}$ must be greater than 0

$\ln 2 =$ 0.693 because $e^{.693} = 2$

$e^{\ln 2} =$ 2 $\quad e^{\ln 10} =$ 10 $\quad e^{\ln e} =$ e $\quad e^{\ln x} =$ x

For those of you who felt a math joke coming, here it is (**WARNING** This joke may be offensive to some)

Question: What is the number one name in the world?

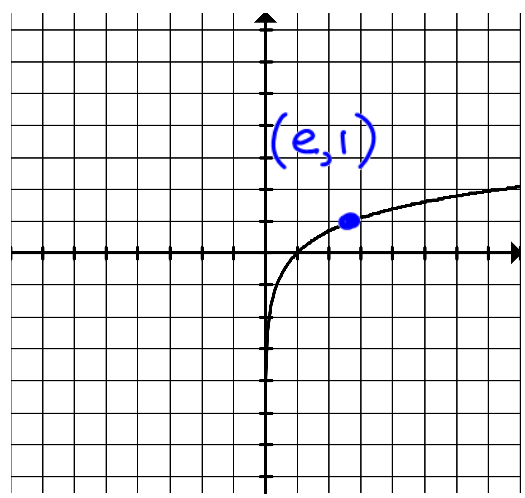
Answer: Lonnie $(\ln e)$ $\qquad \ln e^1 = 1$

The graph of $y = \ln x$ should behave in a similar way to the graph of $y = \log x$

x-int at (1,0)

asymptote at x=0

no y-intercept.



Something to ponder: The equation $e^{i\pi} + 1 = 0$ is considered by many mathematicians to be among the most "beautiful" in all of mathematics. It nicely relates probably the 5 most important numbers in all of mathematics: 1, 0, *e*, π, and $i\left(\sqrt{-1}\right)$