Definition The number "e" is the number for which $\lim\limits_{h\to 0}\frac{e^h-1}{h}=1$
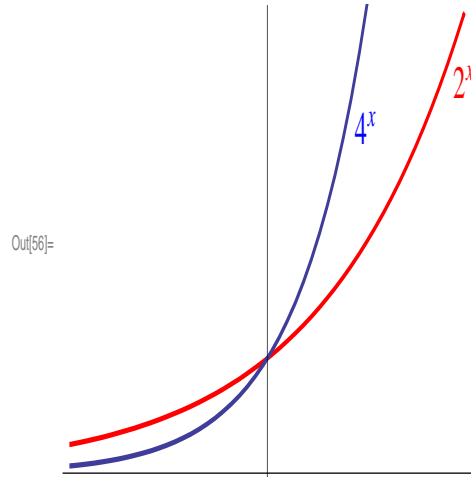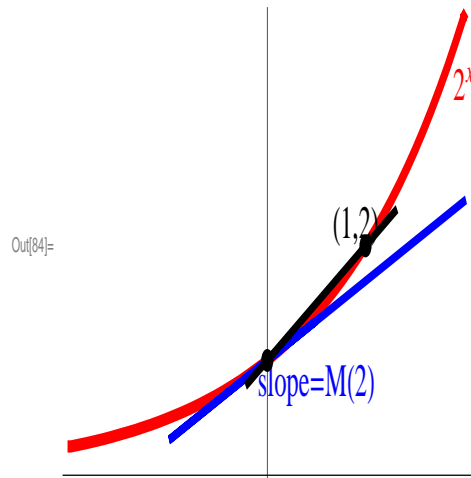
<u>Now can we be sure there is such a number "e"?</u> is a good question to ask at this point. First notice that as the base "a" increases, the graph a^x gets steeper.

Next, we will estimate the slope M(a) for $a=2$ and $a=4$ geometrically. Look at the graph of 2^x below

The secant line from $(0,1)$ to $(1,2)$ of the graph $y=2x$ has slope 1. Therefore, the slope of $y=2^x$ at $x=0$ is less: $M(2)<1$