The Functions 10^x and 2^x

We computed that $\frac{d}{dx}a^x = (\ln a)a^x$.

So

$$\frac{d}{dx}2^x = (\ln 2)2^x$$

and

$$\frac{d}{dx}10^x = (\ln 10)10^x.$$

Even if we insist on starting with another base, like 2 or 10, the natural logarithm appears. They come up naturally, independent of our human preferences like base 2 or base 10. The base e may seem strange at first, but it comes up everywhere. After a while you'll learn to appreciate just how natural it is.

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