Proof of the derivative of e^x

Let $y = e^x$, and then find $\frac{dy}{dx}$.

If $y = e^x$, then $\ln y = x$.

$$\frac{1}{y}\frac{dy}{dx} = 1$$ (implicit derivative of $\ln y = x$)

$$\frac{dy}{dx} = y$$ (multiply both sides by y)

$$\frac{dy}{dx} = e^x$$ (substitution)