Common Calculus Mistakes

Derivative of an exponential function

The Goal

Find

$$\frac{d}{dt}(e^t)$$

The Mistake

Find the mistake:

$$\frac{d}{dt}(e^t) = te^{t-1}$$

Need a hint? Look carefully at the red part:

$$\frac{d}{dt}(e^t) = te^{t-1}$$

The Correction

$$\frac{d}{dt}(e^t) = e^t$$

An Explanation

An exponential function is *not* a power function, so the *power rule* can *not* be used to find its derivative. A power function has the independent variable (t in this context) in the base of the function, as in t^3. An exponential function has the independent variable in the *exponent* of the function, as in e^t. Use the formula for the derivative of an exponential function in this case!