Common Calculus Mistakes

Derivative of inverse sine

The Goal

Find

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

The Mistake

Find the mistake:

$$\frac{d}{dx}(2^x) = x2^{x-1}$$

Need a hint? Look carefully at the red part:

$$\frac{d}{dx}(2^x) = x2^{x-1}$$

The Correction

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

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 (x in this context) in the base of the function, as in x^2. An exponential function has the independent variable in the *exponent* of the function, as in 2^x. Use the formula for the derivative of an exponential function in this case!