Common Algebra Mistakes

Fragment: Order of Operations with Exponential Expression

The Mistake Fragment

Find the algebra mistake:

$$\ln 2 \cdot 2^x = 1.386^x$$

Need a hint? Look carefully at the red part of the algebra:

$$\ln 2 \cdot 2^x = 1.386^x$$

The Correction

$$\ln 2 \cdot 2^x = \ln 2 \cdot 2^x$$

An Explanation

The ln(2) cannot be combined with the 2 since the 2 is raised to the power x while the ln(2) is not. The order of operations rules mean that 2 is raised to the power x first and then the result is multiplied by ln(2). The ln(2) and the 2 *could* be combined if *both* were raised to a common power, as follows:

$$(\ln 2)^x \cdot 2^x = (\ln 2 \cdot 2)^x \approx 1.386^x$$