Common Algebra Mistakes
Example: Function Notation

The Goal

Compute f(g(4)) if f(4) = -4, g(4) = -2 and f(-2) = -1.

The Mistake

Find the algebra mistake:

$$f(g(4)) = f(4)g(4) = (-4)(-2) = 8$$

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

$$f(g(4)) = f(4)g(4) = (-4)(-2) = 8$$

The Correction

$$f(g(4)) = f(-2) = -1$$

An Explanation

The expression f(g(4)) does not indicate the product of two function values. In other words, it is not equal to f(4) times g(4). Instead, f(g(4)) means to compute g(4) and plug the result into the function f(x). In this case g(4) = -2, so f(g(4)) = f(-2) = -1. This is an example of *function composition*.