Common Algebra Mistakes
Example: Improper Cancellation

The Goal

Simplify the rational expression:

$$\frac{2x}{x^2+1}$$

The Mistake

Find the algebra mistake:

$$\frac{2x}{x^2+1} = \frac{2\cancel{x}}{\cancel{x^2}+1} = \frac{2}{x+1}$$

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

$$\frac{2x}{x^2+1} = \frac{2\cancel{x}}{\cancel{x^2}+1} = \frac{2}{x+1}$$

The Correction

$$\frac{2x}{x^2+1} = \frac{2x}{x^2+1}$$

An Explanation

Any quantity to be canceled must be a *common factor* of the *entire* numerator and the entire denominator. The numerator and denominator have no common factors, so this expression cannot be simplified.