Common Algebra Mistakes
Example: Solving a Quadratic Equation

The Goal

Solve the following equation for y:

$$y-3=y^2-y-6$$

The Mistake

Find the algebra mistake:

$$y-3=y^2-y-6 \implies y^2=3 \implies y=\pm\sqrt{3}$$

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

$$y-3=y^2-y-6 \implies \color{red}{y^2=3} \implies y=\pm\sqrt{3}$$

The Correction

$$y-3=y^2-y-6 \implies \color{blue}{y^2-2y-3=0} \implies (y-3)(y+1)=0 \implies y=-1,3$$

An Explanation

The mistake was in canceling the "y" from both sides, despite the fact that on the left side the term is y and on the right side it is -y. To cancel from both sides the terms must be equal (including the same coefficients). "The Correction" shows how to solve the equation: bring all terms to one side and then factor.
(If it is not apparent how to factor a quadratic, then solve by completing the square or by using the quadratic formula.)