REWRITING EQUATIONS The approach you use to solve a formula for a variable can be applied to other algebraic equations.

EXAMPLE 3 Rewrite a linear equation

Solve $9x - 4y = 7$ for y. Then find the value of y when $x = -5$.

Solution

STEP 1 **Solve** the equation for y.

$9x - 4y = 7$ — Write original equation.

$-4y = 7 - 9x$ — Subtract $9x$ from each side.

$y = -\frac{7}{4} + \frac{9}{4}x$ — Divide each side by -4.

AVOID ERRORS When dividing each side of an equation by the same number, remember to divide every term by the number.

STEP 2 **Substitute** the given value into the rewritten equation.

$y = -\frac{7}{4} + \frac{9}{4}(-5)$ — Substitute -5 for x.

$y = -\frac{7}{4} - \frac{45}{4}$ — Multiply.

$y = -13$ — Simplify.

CHECK

$9x - 4y = 7$ — Write original equation.

$9(-5) - 4(-13) \stackrel{?}{=} 7$ — Substitute -5 for x and -13 for y.

$7 = 7$ ✓ — Solution checks.

EXAMPLE 4 Rewrite a nonlinear equation

Solve $2y + xy = 6$ for y. Then find the value of y when $x = -3$.

Solution

AVOID ERRORS If you rewrite the equation as $y = \frac{6 - 2y}{x}$, then you have not solved for y because y still appears on both sides of the equation.

STEP 1 **Solve** the equation for y.

$2y + xy = 6$ — Write original equation.

$(2 + x)y = 6$ — Distributive property

$y = \frac{6}{2 + x}$ — Divide each side by $(2 + x)$.

STEP 2 **Substitute** the given value into the rewritten equation.

$y = \frac{6}{2 + (-3)}$ — Substitute -3 for x.

$y = -6$ — Simplify.

GUIDED PRACTICE for Examples 3 and 4

Solve the equation for y. Then find the value of y when $x = 2$.

8. $y - 6x = 7$ **9.** $5y - x = 13$ **10.** $3x + 2y = 12$

11. $2x + 5y = -1$ **12.** $3 = 2xy - x$ **13.** $4y - xy = 28$