3.8 Rewrite Equations and Formulas

Goal • Write equations in function form and rewrite formulas.

Your Notes

VOCABULARY

Function form An equation in x and y written so the dependent variable y is isolated on one side of the equation

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Literal equation An equation that contains two or more variables

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Example 1 *Rewrite an equation in function form*

Write $2x + 2y = 10$ in function form.

Solution

Solve the equation for y.

$2x + 2y = 10$	**Write original equation.**
$2y = \underline{10 - 2x}$	**Subtract** $\underline{2x}$ **from each side.**
$y = \underline{5 - x}$	**Divide each side by** $\underline{2}$.

The equation $y = \underline{5 - x}$ is written in function form.

Example 2 *Solve a literal equation*

Solve $a + by = c$ for a.

Solution

$a + by = c$	**Write original equation.**
$a = \underline{c - by}$	**Subtract** $\underline{by}$ **from each side.**

The solution is $a = \underline{c - by}$.

Example 3 *Solve and use a formula*

The interest *I* on an investment of *P* dollars at an interest rate *r* for *t* years is given by the formula *I* = *Prt*.

a. Solve the formula for the time *t*.

b. Use the rewritten formula to find the time it takes to earn $100 interest on $1000 at a rate of 5.0%.

Solution

a. $I = Prt$ Write original formula.

$$\frac{I}{\boxed{Pr}} = t$$ Divide each side by __*Pr*__.

b. Substitute __100__ for *I*, __1000__ for *P*, and __0.05__ for *r* in the rewritten formula.

$$t = \frac{I}{\boxed{Pr}}$$ Write rewritten formula.

$$= \frac{\boxed{100}}{\boxed{1000} \cdot \boxed{0.05}}$$ Substitute.

$$= \underline{2}$$ Simplify.

It will take __2__ years to earn $100 in interest.

✔ *Checkpoint* **Write the equation in function form.**

1. $2x + y = 5$	**2.** $3 + 3y = 9 - 6x$
$y = 5 - 2x$	$y = 2 - 2x$

✔ *Checkpoint* **Complete the following exercises.**

3. Solve $a + by = c$ for *b*.

$b = \dfrac{c}{y} - \dfrac{a}{y}$

4. In Example 3, solve the equation for *P*. Find the investment *P* if *I* = $400, *r* = 4%, and *t* = 4 years.

$P = \dfrac{I}{rt}$; $2500