1.4 Lesson

Key Vocabulary
literal equation, *p. 26*

An equation that has two or more variables is called a **literal equation**. To rewrite a literal equation, solve for one variable in terms of the other variable(s).

EXAMPLE 1 Rewriting an Equation

Solve the equation $2y + 5x = 6$ for y.

	$2y + 5x = 6$	Write the equation.
Undo the addition. →	$2y + 5x - 5x = 6 - 5x$	Subtraction Property of Equality
	$2y = 6 - 5x$	Simplify.
Undo the multiplication. →	$\frac{2y}{2} = \frac{6 - 5x}{2}$	Division Property of Equality
	$y = 3 - \frac{5}{2}x$	Simplify.

Try It **Solve the equation for y.**

1. $5y - x = 10$
2. $4x - 4y = 1$
3. $12 = 6x + 3y$

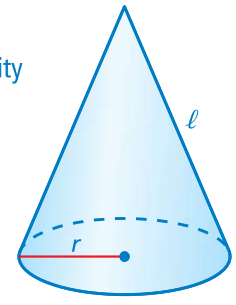
EXAMPLE 2 Rewriting a Formula

The formula for the surface area S of a cone is $S = \pi r^2 + \pi r\ell$. Solve the formula for the slant height ℓ.

Remember

A *formula* shows how one variable is related to one or more other variables. A formula is a type of literal equation.

$S = \pi r^2 + \pi r\ell$	Write the formula.
$S - \pi r^2 = \pi r^2 - \pi r^2 + \pi r\ell$	Subtraction Property of Equality
$S - \pi r^2 = \pi r\ell$	Simplify.
$\frac{S - \pi r^2}{\pi r} = \frac{\pi r\ell}{\pi r}$	Division Property of Equality
$\frac{S - \pi r^2}{\pi r} = \ell$	Simplify.



Try It **Solve the formula for the red variable.**

4. Area of rectangle: $A = bh$
5. Simple interest: $I = Prt$
6. Surface area of cylinder: $S = 2\pi r^2 + 2\pi rh$

Multi-Language Glossary at *BigIdeasMath.com*

Key Idea

Temperature Conversion

A formula for converting from degrees Fahrenheit F to degrees Celsius C is

$$C = \frac{5}{9}(F - 32).$$

EXAMPLE 3 Rewriting the Temperature Formula

Solve the temperature formula for F.

$C = \frac{5}{9}(F - 32)$ — Write the temperature formula.

Use the reciprocal. → $\frac{9}{5} \cdot C = \frac{9}{5} \cdot \frac{5}{9}(F - 32)$ — Multiplication Property of Equality

$\frac{9}{5}C = F - 32$ — Simplify.

Undo the subtraction. → $\frac{9}{5}C + 32 = F - 32 + 32$ — Addition Property of Equality

$\frac{9}{5}C + 32 = F$ — Simplify.

▶ The rewritten formula is $F = \frac{9}{5}C + 32$.

Try It

7. Solve the formula $F = \frac{9}{5}C + 32$ for C. Justify your answer.

Self-Assessment for Concepts & Skills

Solve each exercise. Then rate your understanding of the success criteria in your journal.

8. REWRITING A FORMULA The formula for the circumference of a circle is $C = 2\pi r$. Solve the formula for r.

9. DIFFERENT WORDS, SAME QUESTION Which is different? Find "both" answers.

Solve $4x = 6 + 2y$ for y.

Solve $6 = 4x - 2y$ for y.

Solve $2y - 4x = -6$ for y.

Solve $2y - 4x = 6$ for y.