

TWO OR MORE VARIABLES An equation in two variables, such as $3x + 2y = 8$, or a formula in two or more variables, such as $A = \frac{1}{2}bh$, can be rewritten so that one variable is a function of the other variable(s).

EXAMPLE 2 Rewrite an equation

Write $3x + 2y = 8$ so that y is a function of x .

$$3x + 2y = 8 \quad \text{Write original equation.}$$

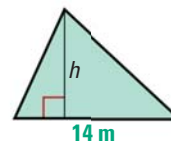
$$2y = 8 - 3x \quad \text{Subtract } 3x \text{ from each side.}$$

$$y = 4 - \frac{3}{2}x \quad \text{Divide each side by 2.}$$

EXAMPLE 3 Solve and use a geometric formula

The area A of a triangle is given by the formula $A = \frac{1}{2}bh$ where b is the base and h is the height.

- Solve the formula for the height h .
- Use the rewritten formula to find the height of the triangle shown, which has an area of 64.4 square meters.



Solution

- $A = \frac{1}{2}bh$ Write original formula.

$$2A = bh \quad \text{Multiply each side by 2.}$$

$$\frac{2A}{b} = h \quad \text{Divide each side by } b.$$

- Substitute 64.4 for A and 14 for b in the rewritten formula.

$$h = \frac{2A}{b} \quad \text{Write rewritten formula.}$$

$$= \frac{2(64.4)}{14} \quad \text{Substitute 64.4 for } A \text{ and 14 for } b.$$

$$= 9.2 \quad \text{Simplify.}$$

- ▶ The height of the triangle is 9.2 meters.

 at classzone.com

USE UNIT ANALYSIS

When area is measured in square meters and the base is measured in meters, dividing twice the area by the base gives a result measured in meters.

GUIDED PRACTICE for Examples 2 and 3

- Write $5x + 4y = 20$ so that y is a function of x .
- The perimeter P of a rectangle is given by the formula $P = 2\ell + 2w$ where ℓ is the length and w is the width.
 - Solve the formula for the width w .
 - Use the rewritten formula to find the width of the rectangle shown.

$P = 19.2 \text{ ft}$

 w
 7.2 ft