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EXAMPLE

Transforming Formulas for Real-World Problems

The formula $C = \frac{5}{9}(F - 32)$ gives the Celsius temperature C in terms of the Fahrenheit temperature F . Transform the formula to find Fahrenheit temperature in terms of Celsius temperature. Then find the Fahrenheit temperature when the Celsius temperature is 30° .

Step 1 Solve for F .

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

$$\frac{9}{5} \cdot C = \frac{9}{5} \cdot \frac{5}{9}(F - 32) \quad \text{Multiply each side by } \frac{9}{5}, \text{ the reciprocal of } \frac{5}{9}.$$

$$\frac{9}{5}C = F - 32 \quad \text{Simplify.}$$

$$\frac{9}{5}C + 32 = F - 32 + 32 \quad \text{Add 32 to each side.}$$

$$\frac{9}{5}C + 32 = F \quad \text{Simplify.}$$

Step 2 Find F when $C = 30$.

$$\frac{9}{5}(30) + 32 = F \quad \text{Substitute 30 for } C.$$

$$54 + 32 = F \quad \text{Find } \frac{9}{5}(30).$$

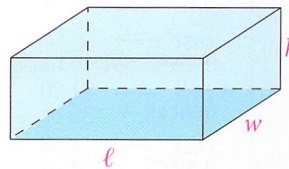
$$86 = F$$

● 30°C is equivalent to 86°F .

EXERCISES

1. a. Solve the formula $V = \ell wh$ for h .
- b. Copy and complete the table to find the height for rectangular prisms with the given volumes, lengths, and widths.

V	54 in. ³	64 in. ³	72 in. ³	90 in. ³
ℓ	3 in.	4 in.	3 in.	18 in.
w	2 in.	4 in.	8 in.	2 in.
h	■	■	■	■



2. a. **Construction** Bricklayers use the formula $N = 7LH$ to estimate the number of bricks N needed to build a wall of height H given a length L in feet. Transform the formula to find the height of a wall in terms of the length and the number of bricks.
- b. What is the height of a wall that is 30 feet long and requires 2135 bricks to build?
3. You can use the number of chirps a cricket makes in one minute to estimate the outside temperature F in Fahrenheit. Transform the formula $F = \frac{t}{4} + 37$ to find the number of chirps a cricket makes in a minute in terms of a given temperature. How many chirps can you expect if the temperature is 60°F ?