Exercise 45

To convert from x degrees Celsius to y degrees Fahrenheit, we use the formula $f(x) = \frac{9}{5}x + 32$. Find the inverse function, if it exists, and explain its meaning.

Solution

In order to find the inverse function, switch x with y in the given equation.

$$x = \frac{9}{5}y + 32$$

Now solve for y.

$$x - 32 = \frac{9}{5}y$$

Multiply both sides by 5.

$$5(x - 32) = 9y$$

Divide both sides by 9.

$$\frac{5}{9}(x - 32) = y$$

Therefore, the inverse function is

$$f^{-1}(x) = \frac{5}{9}(x - 32).$$

This formula gives the Celsius temperature for a given Fahrenheit temperature x.