

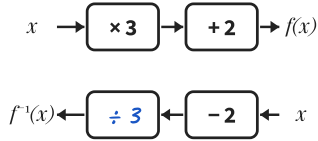
Inverse Functions

ANSWERS

1

$$f(x) = 3x + 2$$

Find $f^{-1}(x)$.

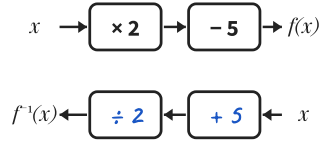


$$f^{-1}(x) = \frac{x-2}{3}$$

2

$$f(x) = 2x - 5$$

Find $f^{-1}(x)$.

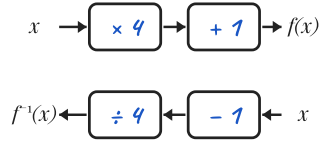


$$f^{-1}(x) = \frac{x+5}{2}$$

3

$$f(x) = 4x + 1$$

Find $f^{-1}(x)$.

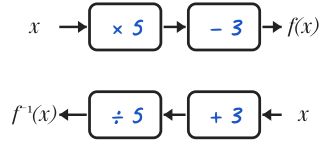


$$f^{-1}(x) = \frac{x-1}{4}$$

4

$$f(x) = 5x - 3$$

Find $f^{-1}(x)$.

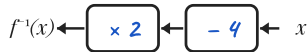


$$f^{-1}(x) = \frac{x+3}{5}$$

5

$$f(x) = \frac{x}{2} + 4$$

Find $f^{-1}(x)$.



$$f^{-1}(x) = 2(x-4)$$

6

$$f(x) = \frac{x+3}{5}$$

Find $f^{-1}(x)$.



$$f^{-1}(x) = 5x - 3$$

7

$f(x) = 3x - 5$. Find $f^{-1}(10)$.

$$(10+5) \div 3$$

Answer 5

8

$f(x) = 2x + 1$. Solve $f^{-1}(x) = 4$.

$$x = f(4)$$

Answer $x = 9$

Inverse Functions further practice

ANSWERS

9

$$f(x) = 7 - 2x$$

Find $f^{-1}(x)$.

$$y = 7 - 2x$$

$$2x = 7 - y$$

$$\text{Answer } f^{-1}(x) = \frac{7-x}{2}$$

10

$$f(x) = 2x^3 - 5$$

Find $f^{-1}(x)$.

$$y = 2x^3 - 5, \text{ so } x^3 = \frac{y+5}{2}$$

$$\text{Answer } f^{-1}(x) = \sqrt[3]{\frac{x+5}{2}}$$

11

A code turns a number x into $f(x) = ax + b$. To decode, you use $f^{-1}(x) = \frac{x-b}{a}$. Find a and b .

Then use the code to turn 9 into a code number.

$$f^{-1}: \text{subtract 3, then divide by 4}$$

$$\text{so } f: \text{multiply by 4, then add 3. } f(9) = 39$$

$$\text{Answer } a = 4, b = 3, 39$$

12

The fare, in pounds, for a taxi journey of x miles is $f(x) = 2.5x + 4$. Find $f^{-1}(x)$. Work out $f^{-1}(29)$ and say what it tells you.

$$f^{-1}(x) = \frac{x-4}{2.5}$$

$$f^{-1}(29) = \frac{25}{2.5} = 10$$

Answer 10: a £29 fare is for 10 miles

13

$f(x) = \pi x^2$ gives the area of a circle of radius x m. Find $f^{-1}(x)$. A circular rug has an area of 2.25π m². Use f^{-1} to find its radius.

$$y = \pi x^2, \text{ so } x^2 = \frac{y}{\pi}$$

$$\sqrt{2.25} = 1.5$$

$$\text{Answer } f^{-1}(x) = \sqrt{\frac{x}{\pi}}, 1.5 \text{ m}$$

14

$$f(x) = 2x + 5$$

Solve $f(x) = f^{-1}(x)$

$$f^{-1}(x) = \frac{x-5}{2}$$

$$4x + 10 = x - 5$$

$$\text{Answer } x = -5$$

15

$$f(x) = \frac{6}{x+2}$$

Find $f^{-1}(x)$. Then solve $f^{-1}(x) = 1$

$$y(x+2) = 6, \text{ so } x = \frac{6}{y} - 2$$

$$\frac{6}{x} - 2 = 1, \text{ so } x = 2$$

$$\text{Answer } f^{-1}(x) = \frac{6}{x} - 2, x = 2$$

16

$f(x) = 3x + 6$. Sam says $f^{-1}(x) = \frac{x}{3} - 6$ because you do the opposite of each step. Is Sam right? Explain.

$$\text{subtract 6 first, then divide by 3}$$

$$f(2) = 12, \text{ but } \frac{12}{3} - 6 = -2$$

$$\text{Answer No, } f^{-1}(x) = \frac{x-6}{3}$$