

Precalculus - Inverse Functions - Worksheet

Common Core F-BF.B.4a, F-BF.B.4b, F-BF.B.4c, F-BF.B.4d · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice inverse functions (Common Core F-BF.B.4a through F-BF.B.4d). You will test for one-to-one functions, find inverses algebraically, verify with compositions and restrict domains.

Precalculus · Common Core State Standards: **F-BF.B.4a, F-BF.B.4b, F-BF.B.4c, F-BF.B.4d**

Exercise 1 - One-to-one table

x	1	2	3	4
f(x)	6	9	6	11

Table of f.

Is f one-to-one? Explain.

Exercise 2 - Inverse of a line

Find $f^{-1}(x)$ for $f(x) = 3x - 6$.

Exercise 3 - Inverse of a quotient by a constant

Find $f^{-1}(x)$ for $f(x) = \frac{x+4}{5}$.

Exercise 4 - Inverse of a cubic

Find $f^{-1}(x)$ for $f(x) = x^3 + 1$.

Exercise 5 - Inverse of a rational function

Find $f^{-1}(x)$ for $f(x) = \frac{2}{x-1}$.

Exercise 6 - Inverse of a root

Find $f^{-1}(x)$ for $f(x) = \sqrt{x-2}$ and state its domain.

Exercise 7 - Inverse of a restricted parabola

Find the inverse of $f(x) = (x-3)^2$ for $x \geq 3$.

Exercise 8 - Verify inverses

Show that $f(x) = 4x+7$ and $g(x) = \frac{x-7}{4}$ are inverses.

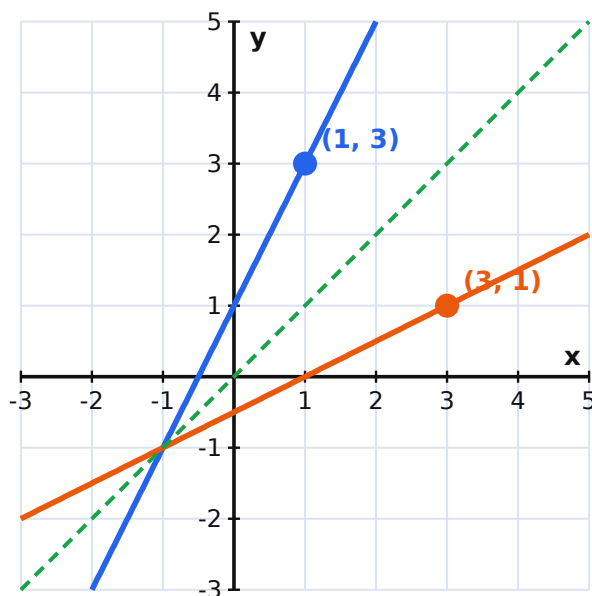
Exercise 9 - Read a table of an inverse

x	1	2	3	4
f(x)	5	8	11	14

Table of f.

Use the table to find $f^{-1}(11)$, $f^{-1}(5)$ and $f(f^{-1}(14))$.

Exercise 10 - Equation from a graph



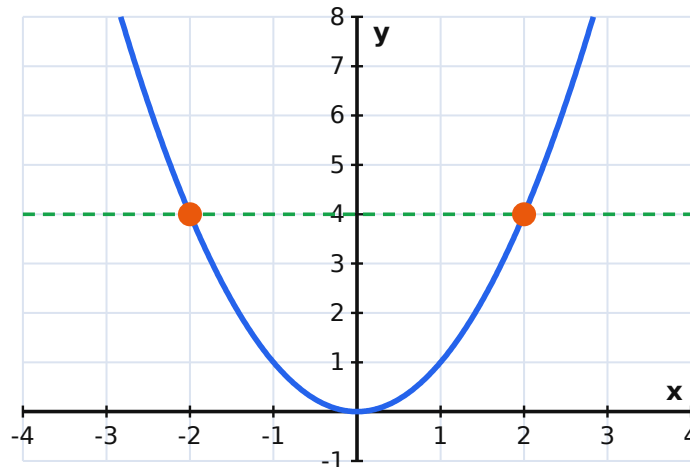
Graph of $f(x) = 2x + 1$ and its mirror image.

The graph shows $f(x) = 2x + 1$ (blue) and a second line (orange) that mirrors it over $y = x$. Write the equation of the orange line.

Exercise 11 - Domain and range of an inverse

For $f(x) = \sqrt{x+1}$, state the domain and range of f and of f^{-1} , and find $f^{-1}(x)$.

Exercise 12 - Restrict the domain



Graph of $y = x^2$.

The function $f(x) = x^2 - 4$ is not one-to-one. Restrict the domain to $x \geq 0$ and find the inverse.

Exercise 13 - Temperature conversion

The formula $F = 1.8C + 32$ converts Celsius to Fahrenheit. Solve for C , then convert $95^\circ F$ to Celsius.

Exercise 14 - Rational inverse and check

Find $f^{-1}(x)$ for $f(x) = \frac{x+2}{x-3}$, then check with $x = 5$.

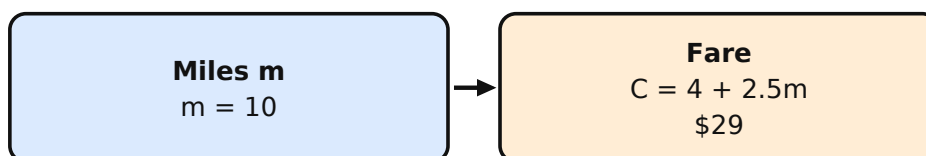
Exercise 15 - Complete the square first

Find the inverse of $f(x) = x^2 + 6x$ for $x \geq -3$.

Exercise 16 - Another rational inverse

Find $f^{-1}(x)$ for $f(x) = \frac{x}{x+2}$.

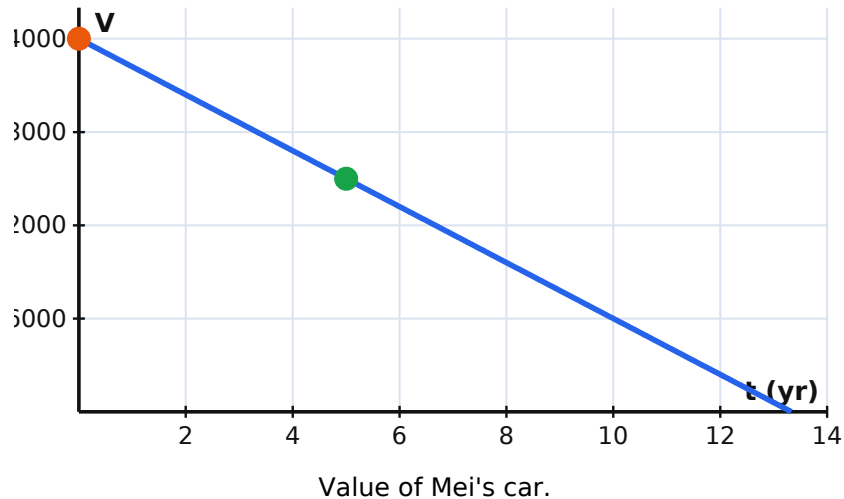
Exercise 17 - Taxi fare inverse



Fare for 10 miles.

An Austin taxi charges $C(m) = 4 + 2.5m$ dollars for m miles. Find C^{-1} , explain what it tells you, and find how far Liam rides for \$29.

Exercise 18 - Car value

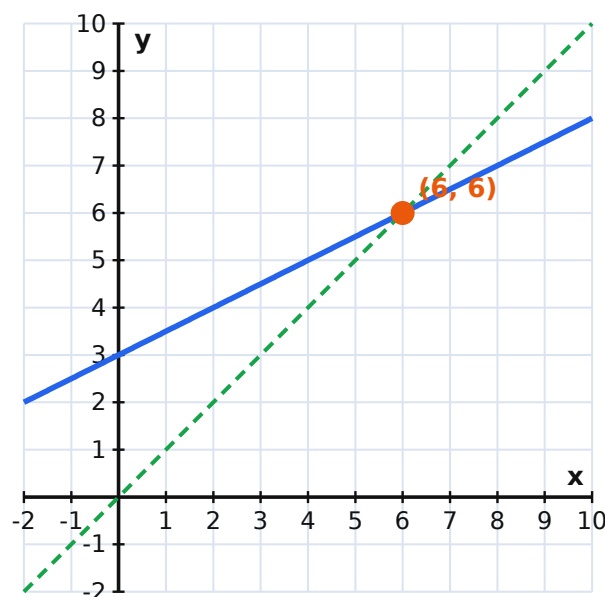


The value of Mei's car is $V(t) = 24,000 - 1,800t$ dollars after t years. Find the inverse, and use it to find when the value is \$15,000 and when it is \$12,000.

Exercise 19 - Find f from its inverse

A linear function f has inverse $f^{-1}(x) = \frac{x-3}{2}$. Find $f(x)$ and check that $f(1) = 5$.

Exercise 20 - Where f meets its inverse



Graph of f and $y = x$.

Let $f(x) = \frac{x}{2} + 3$. The point $(2, 4)$ is on f . Name the matching point on f^{-1} , then find the point where f meets the line $y = x$ (this point is also on f^{-1}).