

Precalculus - Inverse Functions - Quiz

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: ____/____/____

Answer 10 multiple-choice questions on inverse functions. Each explanation points out the common mistake, such as treating f inverse as a reciprocal.

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

Questions

Question 1

Find $f^{-1}(x)$ for $f(x) = 2x + 8$.

- A. $\frac{x-8}{2}$
- B. $\frac{x+8}{2}$
- C. $\frac{1}{2x+8}$
- D. $2x-8$

Question 2

Which graph test shows a function has an inverse?

- A. Vertical line test
- B. Midpoint test
- C. Slope test
- D. Horizontal line test

Question 3

The table shows f . What is $f^{-1}(10)$?

x	1	3	5
f(x)	4	10	16

Table of f .

- A. 3
- B. 10
- C. $\frac{1}{10}$
- D. 13

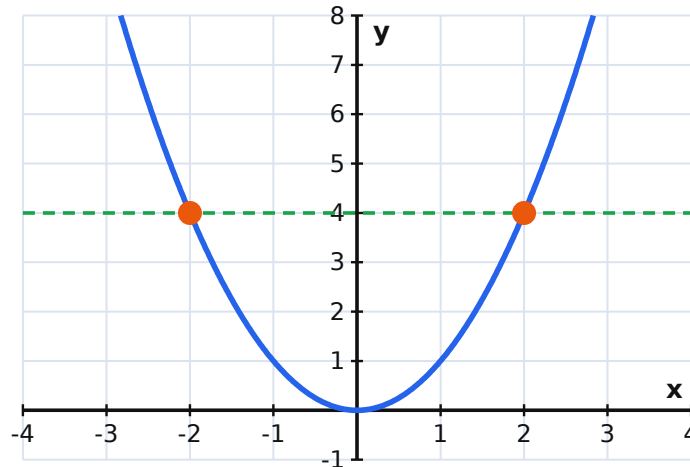
Question 4

The graph of f contains $(2,7)$. Which point is on the graph of f^{-1} ?

- A. $(-2,-7)$
- B. $(2,-7)$
- C. $(7,2)$
- D. $(-7,2)$

Question 5

Does this graph represent a one-to-one function?



Parabola crossed by $y = 4$.

- A. Yes, it passes the vertical line test
- B. No, $y = 4$ meets it twice
- C. Yes, it is symmetric
- D. No, it has no y-intercept

Question 6

Which function is the inverse of $f(x) = x^3$?

- A. x^{-3}
- B. $\sqrt[3]{x}$
- C. $\frac{1}{x^3}$
- D. $3x$

Question 7

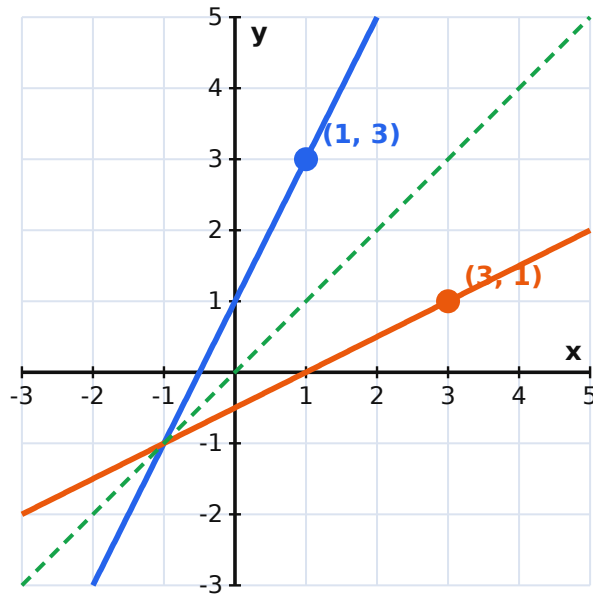
If f has domain $[0, \infty)$ and range $[2, \infty)$, what is the domain of f^{-1} ?

- A. $[2, \infty)$
- B. $[0, \infty)$
- C. $(-\infty, 2]$

D. $(-\infty, \infty)$

Question 8

The graphs show a function, its inverse and the line $y = x$. What kind of symmetry is shown?



Line and its inverse.

- A. Reflection over the y -axis
- B. Reflection over the x -axis
- C. Reflection over $y = x$
- D. Rotation about the origin

Question 9

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

- A. $4x-1$
- B. $\frac{4}{x-1}$
- C. $\frac{x+1}{4}$
- D. $4x+1$

Question 10

What restriction makes $f(x) = x^2$ invertible?

- A. $x \neq 0$
- B. $x \geq 0$
- C. $x \leq 4$
- D. No restriction is needed

Answers

1. **A** - Swap x and y , then solve: $y = (x - 8)/2$. The reciprocal is not the inverse.
2. **D** - A one-to-one function passes the horizontal line test, so each output has one input.
3. **A** - The inverse reverses the pair: $f(3) = 10$ means $f^{-1}(10) = 3$.
4. **C** - Inverse graphs swap coordinates: reflection over $y = x$ sends (a, b) to (b, a) .
5. **B** - The horizontal line $y = 4$ hits the graph at two points, so it is not one-to-one.
6. **B** - The inverse of cubing is the cube root: cube root of x^3 is x .
7. **A** - The range of f becomes the domain of f^{-1} .
8. **C** - The graphs of f and f^{-1} are mirror images across $y = x$.
9. **D** - $x = (y - 1)/4$ gives $y = 4x + 1$. The sign of the 1 flips when you move it across.
10. **B** - Restricting to $x \geq 0$ passes the horizontal line test, with inverse the square root.

Remember

- $f^{-1}(f(x)) = x$ and $f(f^{-1}(x)) = x$.
- Find an inverse: write $y = f(x)$, swap x and y , solve for y .
- Domain of f becomes the range of f^{-1} , and the range of f becomes the domain of f^{-1} .
- The graph of f^{-1} is the reflection of the graph of f over $y = x$.
- Restrict the domain of a function that is not one-to-one, such as x^2 with $x \geq 0$.