

Composition Of Functions Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is the notation for the composition of functions (f) and (g) ?

undefined. $(f + g)$

undefined. $(f \times g)$

undefined. $(f \circ g)$ ✓

undefined. $(f - g)$

The correct notation for the composition of functions is $(f \circ g)$.

Which of the following statements are true about function composition?

undefined. The order of functions in composition matters. ✓

undefined. $(f \circ g)(x) = g(f(x))$.

undefined. The composition of functions can only be performed if the range of the first function is within the domain of the second. ✓

undefined. Function composition is commutative.

The order of functions matters, and the composition can only be performed if the range of the first function is within the domain of the second.

Explain in your own words what it means to compose two functions.

To compose two functions means to apply one function to the result of another function.

Identify the inner and outer functions in the composition $(f \circ g)(x)$.

1. Inner function:

$g(x)$

2. Outer function:

$f(x)$

The inner function is $g(x)$ and the outer function is $f(x)$.

Part 2: Comprehension and Application

If $f(x) = 2x + 3$ and $g(x) = x^2$, what is $(f \circ g)(x)$?

undefined. $2x^2 + 3$ ✓

undefined. $2x + 3x^2$

undefined. $(2x + 3)^2$

undefined. $2(x^2) + 3$

The composition $(f \circ g)(x)$ results in $2x^2 + 3$.

Consider the functions $f(x) = \sqrt{x}$ and $g(x) = x - 1$. Which of the following are true about the domain of $(f \circ g)(x)$?

undefined. The domain is all real numbers.

undefined. The domain is $x \geq 1$. ✓

undefined. The domain is $x > 0$.

undefined. The domain is $x \leq 1$.

The domain of $(f \circ g)(x)$ is $x \geq 1$.

Create a real-world scenario where composing two functions would be necessary, and describe the functions involved.

An example could be calculating the total cost of an item after tax, where one function calculates the price and another calculates tax.

Given $f(x) = 3x - 5$ and $g(x) = x + 4$, find $(g \circ f)(2)$.

undefined. 11 ✓

undefined. 7

undefined. 5

undefined. 9

The result of $(g \circ f)(2)$ is 11.

Part 3: Analysis, Evaluation, and Creation

If $f(x) = x^2$ and $g(x) = \frac{1}{x}$, what is the domain of $(f \circ g)(x)$?

undefined. $x \neq 0$ ✓

undefined. $x > 0$

undefined. $x < 0$

undefined. All real numbers

The domain of $(f \circ g)(x)$ is $x \neq 0$.

Analyze the functions $f(x) = 2x + 1$ and $g(x) = x^2 - 4$. Which of the following statements are true about $(f \circ g)(x)$?

undefined. The range of $g(x)$ affects the domain of f . ✓

undefined. $(f \circ g)(x) = 2(x^2 - 4) + 1$. ✓

undefined. The composition is not defined for $x = 2$.

undefined. The composition is defined for all real numbers. ✓

The range of $g(x)$ affects the domain of f , and the composition is defined for all real numbers.

Evaluate whether the functions $f(x) = x + 1$ and $g(x) = x - 1$ are inverses. Justify your answer.

The functions are inverses because $f(g(x)) = x$ and $g(f(x)) = x$.

Design a pair of functions $f(x)$ and $g(x)$ such that their composition $(f \circ g)(x)$ results in a linear function. Explain your reasoning.

An example could be $f(x) = 2x$ and $g(x) = x + 3$, resulting in a linear function.