

Objective 2 - Composition

Evaluate the composition of two functions.

Link to section in online textbook.

First, watch [this video](#) to learn how use a new operation on functions: Composition.

Question 1 For the two functions below, evaluate $(f \circ g)(-3)$ and $(g \circ f)(-3)$

$$f(x) = -6x + 6$$

$$g(x) = 3x + 6$$

$$(f \circ g)(-3) = \boxed{24.0}$$

$$(g \circ f)(-3) = \boxed{78.0}$$

Feedback(attempt): Remember, the order is important! This joins subtraction and division where the order matters.

Question 2 For the two functions below, evaluate $(f \circ g)(4)$ and $(g \circ f)(4)$

$$f(x) = 5x^2 - 6x + 3$$

$$g(x) = \frac{1}{4x - 5}$$

$$(f \circ g)(4) = \boxed{2.496}$$

$$(g \circ f)(4) = \boxed{0.004}$$

Feedback(correct): Great! Beyond our first question, we needed to be careful that we could plug in our values, as $g(x)$ has a restricted domain.

Learning outcomes:
Author(s): Darryl Chamberlain Jr.

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Question 3 For the two functions below, evaluate $(f \circ g)(-1)$ and $(g \circ f)(-1)$

$$f(x) = 4x^3 - 3x^2 - 5x - 5$$

$$g(x) = \sqrt{-6x - 5}$$

$$(f \circ g)(-1) = \boxed{-9.0}$$

$$(g \circ f)(-1) = \boxed{6.083}$$

Feedback(correct): Great! Beyond our first question, we needed to be careful that we could plug in our values, as $g(x)$ has a restricted domain.

Question 4 For the two functions below, evaluate $(f \circ g)(4)$ and $(g \circ f)(4)$

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

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

$$(f \circ g)(4) = \boxed{4.0}$$

$$(g \circ f)(4) = \boxed{4.0}$$

Question 5 One of the biggest takeaways from this objective is noticing that $(f \circ g)(x) \neq (g \circ f)(x)$ **in most cases**.

For which question was $(f \circ g)(x) \neq (g \circ f)(x)$? $\boxed{4}$

Feedback(attempt): It is just asking for the number of the question. The answer is either "1", "2", "3", or "4".

Feedback(correct): Great job! But since it wasn't always the case, it should make you wonder: when is it that $(f \circ g)(x) = (g \circ f)(x)$? The next two objectives will answer this question.