

Composing and Decomposing Practice

Composing functions means making a new function by putting one function into another function.

The notation that indicates composition is a little open circle. (It does not mean multiplication.) It means put the second function inside the first.

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

Composing Practice:

Let $f(x) = x - 2$, $g(x) = \sqrt{x}$, $h(x) = \frac{1}{x}$. Find each of the following:

1. $(f \circ g)(x)$

2. $(g \circ h)(x)$

3. $(f \circ h \circ g)(x)$

4. $(h \circ g)\left(\frac{4}{9}\right)$

4. $(g \circ g)(4)$

6. $(h \circ g \circ f)(6)$

Let $f = \{(-3, 1), (0, 4), (2, 0)\}$, $g = \{(-3, 2), (1, 2), (2, 6), (4, 0)\}$, $h = \{(2, 4), (1, 0)\}$. Find:

1. $(f \circ g)(1)$

2. $(g \circ f)(2)$

3. $(f \circ g \circ h)(2)$

4. $f \circ g$

5. $h \circ g$

6. $h \circ g \circ f$

Decomposing a function means finding an inside and an outside function that when put together by composition, gives the function you're trying to decompose. Look for the outside function first, then see what goes inside it.

Decomposing Practice:

Let $h(x) = x^3 - 2$. Find $f(x)$ and $g(x)$ so that $(f \circ g)(x) = h(x)$.

Let $h(x) = \sqrt{x+5}$. Find $f(x)$ and $g(x)$ so that $(f \circ g)(x) = h(x)$.

Let $h(x) = (x-2)^3$. Find $f(x)$ and $g(x)$ so that $(f \circ g)(x) = h(x)$.

Let $h(x) = 3\sqrt{x} - 1$. Find $f(x)$ and $g(x)$ so that $(f \circ g)(x) = h(x)$.

Let $h(x) = \frac{3}{x+2}$. Find $f(x)$ and $g(x)$ so that $(f \circ g)(x) = h(x)$.

Let $h(x) = \frac{x^2+1}{\sqrt{x}-1}$. Find $f(x)$ and $g(x)$ so that $(f \circ g)(x) = h(x)$.