

Composition of Functions 8-7

Let's review . . .

Definition of a function

Domain

Range

Composition of Functions

Examples:

1. If $f(x) = 2x^2 + 3$ and $g(x) = x + 7$, find $g(f(x))$.

2. If $f(x) = 4x - 1$ and $g(x) = x^2 - 4$, find $[g \circ f](x)$.

3. If $f(x) = x + 7$ and $g(x) = x^2 - 4$, find $[f \circ g](2)$ and $[g \circ f](2)$.

4. If $f(x) = x^2$ and $g(x) = 2x^2 + 2x - 1$, find $[f \circ g](x)$ and $[g \circ f](x)$.

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5. If $f(x) = x^2 + 5$, $g(x) = 9x - 1$ and $h(x) = -2x$ find $[f \circ (g \circ h)](x)$.

Recursion

Iteration

Example:

1. Find the first four iterations of each function for the given initial value.

$$f(0) = 7 \text{ and } f(n) = f(n-1) + 2n$$

2. Find the first four iterations of each function for the given initial value.

$$f(0) = \frac{3}{2} \text{ and } f(n) = 2f(n-1)$$

3. Find the first four iterations of each function for the given initial value.

$$f(0) = 96 \text{ and } f(n) = \frac{1}{4} f(n-1)$$