

Section 1-4
Composition of Functions

Definition: Given two functions f and g , the composite function, denoted by $f \circ g$ (read as “ f composed with g ”), is defined by $(f \circ g)(x) = f(g(x))$

For the given functions f and g $f(x) = 2x + 1$ $g(x) = 3x^2 - 5$

Find:

1. $f(g(4))$
2. $g(f(4))$
3. $f(f(2))$
4. $g(g(0))$

If the domains of two functions are restricted, then the domain and range of the composition of those two functions are also restricted.

$$g(x) = x - 3 \quad \text{for } 2 \leq x \leq 7$$

$$f(x) = -2x + 8 \quad \text{for } 1 \leq x \leq 5$$

a. find $f(g(5))$

b. find $f(g(8))$

c. find $f(g(2))$

d. Find an equation that expresses $f(g(x))$ explicitly in terms of x . Find the domain and range.

e. Find the domain of $g(f(x))$

