

# Composite Functions

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

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- 1) If  $f(x) = x$  and  $g(x) = x + 3$ , find the following:

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

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

k)  $(f \circ g)(3) =$

f)  $(g \circ f)(7) =$

l)  $(f \circ g)(5) =$

g)  $(g \circ f)(5) =$

m)  $(f \circ g)(-4) =$

h)  $(g \circ f)(-2) =$

n)  $(f \circ g)(-7) =$

i)  $(g \circ f)(9) =$

o)  $(f \circ g)(0) =$

j)  $(g \circ f)(0) =$

- 2) If  $f(x) = x + 5$  and  $g(x) = 2x$ , find the following:

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

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

a)  $(f \circ g)(5) =$

f)  $(g \circ f)(3) =$

b)  $(f \circ g)(3) =$

g)  $(g \circ f)(6) =$

c)  $(f \circ g)(-1) =$

h)  $(g \circ f)(-5) =$

d)  $(f \circ g)(-4) =$

i)  $(g \circ f)(-1) =$

e)  $(f \circ g)(0) =$

j)  $(g \circ f)(0) =$

- 3) If  $f(x) = 2x + 1$  and  $g(x) = x + 2$ , find the following:

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

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

a)  $(f \circ g)(5) =$

f)  $(g \circ f)(-5) =$

b)  $(f \circ g)(2) =$

g)  $(g \circ f)(-3) =$

c)  $(f \circ g)(0) =$

h)  $(g \circ f)(0) =$

d)  $(f \circ g)(-4) =$

i)  $(g \circ f)(3) =$

e)  $(f \circ g)(-6) =$

j)  $(g \circ f)(6) =$

- 4) If  $f(x) = x + 1$  and  $g(x) = x^2$ , find the following:

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

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

a)  $(f \circ g)(-4) =$

f)  $(g \circ f)(-5) =$

b)  $(f \circ g)(-2) =$

g)  $(g \circ f)(-2) =$

c)  $(f \circ g)(0) =$

h)  $(g \circ f)(-1) =$

d)  $(f \circ g)(5) =$

i)  $(g \circ f)(2) =$

e)  $(f \circ g)(10) =$

j)  $(g \circ f)(4) =$

# Composite Functions (Solutions)

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

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

1) If  $f(x) = x$  and  $g(x) = x + 3$ , find the following:

$$(f \circ g)(x) = f(g(x)) = x + 3$$

$$(g \circ f)(x) = g(f(x)) = x + 3$$

a)  $(f \circ g)(3) = 3 + 3 = 6$

f)  $(g \circ f)(7) = 7 + 3 = 10$

b)  $(f \circ g)(5) = 5 + 3 = 8$

g)  $(g \circ f)(5) = 5 + 3 = 8$

c)  $(f \circ g)(-4) = -4 + 3 = -1$

h)  $(g \circ f)(-2) = -2 + 3 = 1$

d)  $(f \circ g)(-7) = -7 + 3 = -4$

i)  $(g \circ f)(9) = 9 + 3 = 12$

e)  $(f \circ g)(0) = 0 + 3 = 3$

j)  $(g \circ f)(0) = 0 + 3 = 3$

2) If  $f(x) = x + 5$  and  $g(x) = 2x$ , find the following:

$$(f \circ g)(x) = f(g(x)) = 2x + 5$$

$$(g \circ f)(x) = g(f(x)) = 2(x + 5)$$

a)  $(f \circ g)(5) = 2(5) + 5 = 15$

f)  $(g \circ f)(3) = 2(3 + 5) = 16$

b)  $(f \circ g)(3) = 2(3) + 5 = 11$

g)  $(g \circ f)(6) = 2(6 + 5) = 22$

c)  $(f \circ g)(-1) = 2(-1) + 5 = 3$

h)  $(g \circ f)(-5) = 2(-5 + 5) = 0$

d)  $(f \circ g)(-4) = 2(-4) + 5 = -3$

i)  $(g \circ f)(-1) = 2(-1 + 5) = 8$

e)  $(f \circ g)(0) = 2(0) + 5 = 5$

j)  $(g \circ f)(0) = 2(0 + 5) = 10$

3) If  $f(x) = 2x + 1$  and  $g(x) = x + 2$ , find the following:

$$(f \circ g)(x) = f(g(x)) = 2(x + 2) + 1$$

$$(g \circ f)(x) = g(f(x)) = (2x + 1) + 2$$

a)  $(f \circ g)(5) = 2(5 + 2) + 1 = 15$

f)  $(g \circ f)(-5) = (2(-5) + 1) + 2 = -7$

b)  $(f \circ g)(2) = 2(2 + 2) + 1 = 9$

g)  $(g \circ f)(-3) = (2(-3) + 1) + 2 = -3$

c)  $(f \circ g)(0) = 2(0 + 2) + 1 = 5$

h)  $(g \circ f)(0) = (2(0) + 1) + 2 = 3$

d)  $(f \circ g)(-4) = 2(-4 + 2) + 1 = -3$

i)  $(g \circ f)(3) = (2(3) + 1) + 2 = 9$

e)  $(f \circ g)(-6) = 2(-6 + 2) + 1 = -7$

j)  $(g \circ f)(6) = (2(6) + 1) + 2 = 15$

4) If  $f(x) = x + 1$  and  $g(x) = x^2$ , find the following:

$$(f \circ g)(x) = f(g(x)) = x^2 + 1$$

$$(g \circ f)(x) = g(f(x)) = (x + 1)^2$$

a)  $(f \circ g)(-4) = (-4)^2 + 1 = 17$

f)  $(g \circ f)(-5) = ((-5) + 1)^2 = 16$

b)  $(f \circ g)(-2) = (-2)^2 + 1 = 5$

g)  $(g \circ f)(-2) = ((-2) + 1)^2 = 1$

c)  $(f \circ g)(0) = (0)^2 + 1 = 1$

h)  $(g \circ f)(-1) = ((-1) + 1)^2 = 0$

d)  $(f \circ g)(5) = (5)^2 + 1 = 26$

i)  $(g \circ f)(2) = ((2) + 1)^2 = 9$

e)  $(f \circ g)(10) = (10)^2 + 1 = 101$

j)  $(g \circ f)(4) = ((4) + 1)^2 = 25$