

WORKSHEET

LESSON 4-1 : OPERATIONS ON FUNCTIONS

COMPOSITE FUNCTIONS

For each pair of functions, find $[f \circ g](x)$ and $[g \circ f](x)$, if they exist. State the domain and range for each composed function.

A. $f(x) = \{(3, -2), (-1, -5), (4, 7), (10, 8)\}$, $g(x) = \{(4, 3), (2, -1), (9, 4), (3, 10)\}$

- $[f \circ g](x) = f[g(x)]$

$$[f \circ g](4) = f[g(4)] = f(3) = -2$$

$$[f \circ g](2) = f[g(2)] = f(-1) =$$

$$[f \circ g](9) = f[g(9)] = f(4) =$$

$$[f \circ g](3) = f[g(3)] = f(10) =$$

$$f \circ g = \{(4, -2), (2, -5), (9, 7), (3, 8)\}$$

$$\text{Domain, } D = \{4, 2, 9, 3\}$$

$$\text{Range, } R = \{-2, -5, 7, 8\}$$

- $[g \circ f](x) = g[f(x)]$

$$[g \circ f](3) = g[f(3)] = g(-2) = \text{not defined}$$

$$[g \circ f](-1) = g[f(-1)] = g(-5) =$$

$$[g \circ f](4) = g[f(4)] = g(7) =$$

$$[g \circ f](10) = g[f(10)] = g(8) =$$

$g \circ f$

defined (is/is not)

B. $f(x) = x^2 + 2$ and $g(x) = x - 6$

- $[f \circ g](x) = f[g(x)]$

$$= f(x - 6)$$

$$= (\quad)^2 + 2$$

$$= x^2 - \quad x + \quad$$

- $[g \circ f](x) = g[f(x)]$

$$= g(x^2 + 2)$$

$$= \quad^2 - \quad$$