

§ 6.1 Composite Functions

Composition of Functions:

If f and g are functions, then the composite function or composition, of g and f is:

$$(g \circ f)(x) = g[f(x)] \quad (\text{Note: this is read "g of f of x".})$$

for all x in the domain of f such that $f(x)$ is in the domain of g .

Example 1: Let $f(x) = 3x - 1$ & $g(x) = 2x + 3$ Find $(f \circ g)(x)$ and $(g \circ f)(x)$.

Example 2: Let $f(x) = 2x^2 - 3$ and $g(x) = 4x$
Find $(f \circ g)(1)$ and $(g \circ f)(1)$ and $(f \circ f)(-2)$.

Show That Two Composite Functions Are Equal

Example 3:

$$\text{If } f(x) = 3x - 4 \text{ and } g(x) = \frac{1}{3}(x + 4)$$

Show that $(f \circ g)(x)$ and $(g \circ f)(x) = x$