

Compositions of Functions

$F(g(x))$ " F composed with g "

$F \circ g = F(g(x))$ " F composed with g "

$g \circ F = g(F(x))$ " g composed with F "

Example: Let $F(x) = 3x + 1$, $g(x) = \sqrt{x} - 2$

① $F(g(x))$

$$F(x) = 3x + 1$$

$$F(x) = 3(x) + 1$$

$$F(g(x)) = 3(g(x)) + 1$$

$$F(g(x)) = 3(\sqrt{x} - 2) + 1$$

$$= 3\sqrt{x} - 6 + 1$$

$$F(g(x)) = 3\sqrt{x} - 5$$

② $(g \circ F)(9) = g(F(9))$

$$g(x) = \sqrt{x} - 2$$

$$g(F(9)) = \sqrt{F(9)} - 2$$

$$g(F(9)) = \sqrt{3(9) + 1} - 2$$

$$= \sqrt{28} - 2$$