

9-4 Operations with Functions

Composite function

$$f(x) = 3x + 2 \quad g(x) = x^2 - 1$$

Find $f(g(x)) = f(x^2 - 1)$

$$= 3(x^2 - 1) + 2$$
$$= 3x^2 - 3 + 2$$
$$\rightarrow 3x^2 - 1$$

Find $g(f(x)) = g(3x + 2)$

$$(3x + 2)^2 - 1$$
$$(3x + 2)(3x + 2) - 1$$
$$9x^2 + 6x + 6x + 4 - 1$$
$$\rightarrow 9x^2 + 12x + 3$$