

# Composite Functions

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**Example 1:  $f(g(x))$**

Domain:  $x$  → Intermediate:  $y = g(x)$  → Range:  $y^2 - 4$

Equations:  $g(x) = \frac{1}{x}$ ,  $f(x) = x^2 - 4$ ,  $f(g(x)) = \left(\frac{1}{x}\right)^2 - 4$

Restriction:  $x^2 \neq 0$

Rearranging:  $\frac{1}{x^2} - 4$

**Example 2:  $g(f(x))$**

Domain:  $x$  → Intermediate:  $y = f(x)$  → Range:  $\frac{1}{y}$

Equations:  $f(x) = x^2 - 4$ ,  $g(x) = \frac{1}{x}$ ,  $g(f(x)) = \frac{1}{x^2 - 4}$

Restriction:  $x^2 - 4 \neq 0$   
 $(x - 2)(x + 2) \neq 0$   
 $x \neq 2$     $x \neq -2$

**Composite Functions:** A complex function made up of 2 or more simpler functions.

Similar to composite Area

House icon:  $\text{House} = \text{Rectangle} + \text{Triangle}$