

## Lesson 102: Sums & Products of Functions

$$f(x) = x + 6 \quad D = \{\text{Reals}\}$$

$$g(x) = x - 4 \quad D = \{\text{pos. integers}\}$$

Sum of functions:  $(f+g)(x) = f(x) + g(x)$

$$= x + 6 + x - 4$$
$$= 2x + 2 \quad D = \{\text{pos. integers}\}$$

Product of functions:  $(fg)(x) = f(x) \cdot g(x)$

$$= (x + 6)(x - 4)$$
$$= x^2 + 6x - 4x - 24$$
$$= x^2 + 2x - 24$$

$(fg)(-3) = \emptyset$

$D = \{\text{pos. integers}\}$

Examples using a specific value for  $x$ :

Find  $(h+g)(5)$  if  $h(x) = x + 1$   $D = \{\text{Reals}\}$

and  $g(x) = x^2 - 1$   $D = \{\text{Integers}\}$

$$(h+g)(5) = h(5) + g(5)$$

$$= 5 + 1 + 5^2 - 1$$

$$= 30$$

Find  $(hg)(2)$  for the same functions

$$(hg)(2) = h(2) \cdot g(2)$$

$$= (2 + 1)(3)$$

$$= 9$$