

A blue banner with the word 'LESSON' in white on the left, followed by a large '6-1' and the text 'Operations on Functions' in white.

I can... perform composition of functions.

Oct 26-10:57 AM

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

Find:

$$g(4) = 2(4) = 8$$

$$8 - g(10) = 8 - 20 \\ = -12$$

$$f(-3) = -3 + 3 = 0$$

Dec 2-8:06 AM

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

Find:

$$(f + g)(x)$$

$$f(x) + g(x)$$

$$x + 3 + 2x = 3x + 3$$

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

$$2x - x - 3 = x - 3$$

Feb 12-2:09 PM

$$g(x) = 3x - 4 \quad f(x) = -x + 5$$

Find:

$$(f + g)(x) = f(x) + g(x)$$

$$(f - g)(x)$$

Dec 2-8:06 AM

$$g(x) = (3x - 4) \quad f(x) = (-x + 5)$$

Find:

$$\begin{aligned} (f \cdot g)(x) &= f(x) \cdot g(x) \\ &= (-x + 5)(3x - 4) \\ &= -3x^2 + 4x + 15x - 20 \\ &= -3x^2 + 19x - 20 \end{aligned}$$

Dec 2-8:06 AM

$$g(x) = 3x - 4 \quad f(x) = -x + 5$$

Find:

$$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)} = \frac{-x + 5}{3x - 4} \quad x \neq \frac{4}{3}$$

$$\begin{aligned} 3x - 4 &= 0 \\ +4 &+4 \\ 3x &= 4 \\ \frac{3x}{3} &= \frac{4}{3} \end{aligned}$$

Feb 12-2:12 PM

You Try!!

$$g(x) = 5x + 3$$

$$f(x) = -2x - 7$$

Find:

$$\textcircled{1} \left(\frac{g}{f} \right) (x)$$

Find:

$$\textcircled{2} (f \cdot g)(x)$$

$$\textcircled{3} \left(\frac{f}{g} \right) (x)$$

Dec 2-8:06 AM

Composition of Functions:

Results of one function are used in another.

$$f(x) = 5 + 3x$$

$$g(x) = x^2 - 2$$

$$g(3) = 3^2 - 2 = 9 - 2 = 7$$

$$(f \circ g)(3) = f(g(3)) = f(7) = 5 + 3(7)$$

$$(f \circ g)(-2) = f(g(-2)) = f(2)$$

$$g(-2) = (-2)^2 - 2 = 2$$

$$= 5 + 21$$

$$= 26$$

$$f(2) = 5 + 3(2)$$

$$5 + 6 = 11$$

Dec 2-9:00 AM

Composition of Functions:

Results of one function are used in another.

$$(g \circ f)(x) = g(f(x)) = g(5+3x)$$

$$g(5+3x) = (5+3x)^2 - 2$$

$$(5+3x)(5+3x) - 2$$

$$25 + 15x + 15x + 9x^2 - 2$$

$$(g \circ f)(x) = 9x^2 + 30x + 23$$

$$g(x) = x^2 - 2$$

$$(f \circ g)(x) = f(g(x)) = f(x^2 - 2) = 5 + 3(x^2 - 2)$$

$$f(x) = 5 + 3x$$

$$f(x^2 - 2) = 5 + 3(x^2 - 2)$$

$$5 + 3x^2 - 6$$

$$= 3x^2 - 1$$

Dec 2-9:00 AM

$$f(x) = 5 + 3x \quad g(x) = x^2 - 2 \quad h(x) = 2x^2 + x$$

$$(f \circ h)(x) =$$

$$(g \circ h)(x) =$$

Dec 2-9:00 AM

$$f(x) = 2 + 3x \quad g(x) = 2x^2 - 3 \quad h(x) = 4x - 6$$

$$(h \circ f)(x) =$$

$$(h \circ g)(x) =$$

Dec 2-9:00 AM

The functions **f** and **g** are defined by these sets of input and output values. It is just a bunch of tracking...

$$f = \{(5, 4), (3, 1), (6, -2), (4, 7), (-8, 6)\}$$

$$g = \{(-1, 6), (4, -2), (3, 3), (1, -8), (7, 0)\}$$

$$f(g(-1)) = f(6) = -2 \quad g(f(5)) = g(4) = -2$$

$$f(g(7)) \text{ undef.}$$

$$g(f(5)) =$$

Dec 2-9:00 AM

$$f = \{(5, 4), (3, 1), (6, -2), (4, 7), (-8, 6)\}$$

$$g = \{(-1, 6), (4, -2), (3, 3), (1, -8), (7, 0)\}$$

$$f(g(1)) =$$

$$g(f(4)) =$$

$$f(g(3)) =$$

$$g(f(3)) =$$

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Find $(f \circ g)(x)$ and $(g \circ f)(x)$ if they exist. State the domain and range. $D: \{-2, 3, 6, 0, -8\}$ $R: \{5, 1, -2, 4, 6\}$

$$f = \{(-2, 5), (3, 1), (6, -2), (0, 4), (-8, 6)\}$$

$$g = \{(-1, 6), (4, -2), (3, 3), (1, -8), (7, 0)\}$$

$$(f \circ g)(x) = f(g(x))$$

$$D: \{-1, 4, 3, 1, 7\}$$

$$R: \{6, -2, 3, -8, 0\}$$

$$f(6), f(-2), f(3), f(-8), f(0)$$

$$\{-2, 5, 1, 6, 4\}$$

Evaluate $g(x)$ first then find the range of $(f \circ g)(x)$ by finding $f(g(x))$.

For each pair of functions, find $(f \circ g)(x)$ and $(g \circ f)(x)$.

$$f = \{(2,6), (9,4), (7,7), (0,-1)\}$$

$$g = \{(7,0), (-1,7), (4,9), (8,2)\}$$

Feb 12-3:27 PM

Homework 6.1

Pg. 389

#9-150, 17-250, 27-330

Feb 12-2:07 PM