Section 7-6: Function Operations

What do you think each of these means?

$(f+g)(x)$

$f(x)+g(x)$

$(f-g)(x)$

$f(x)-g(x)$

$(f \cdot g)(x)$

$f(x) \cdot g(x)$

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

Use these functions:

$f(a) = 2a^2 + 6a$ $g(a) = 4a$ $h(a) = a + 3$

Perform each function operation and state the domain.

1. (f+h)(a) D: $\mathbb{R}$

$f(a)+h(a) = 2a^2+7a+3$

$2a^2+6a + a+3$

2. (h - g)(a) D: $\mathbb{R}$

$a+3-4a$

$3-3a$

3. (g•f)(a) D: $\mathbb{R}$

$(2a^2+6a)\,4a$

$8a^3+24a^2$

4. $\left(\frac{f}{g}\right)(a)$ D: $a \neq 0$

$\frac{2a^2+6a}{4a} = \frac{2a(a+3)}{2\cancel{4a}} = \frac{a+3}{2}$

Use these funcitons:

$f(x) = x^2 - 3x$ $g(x) = x-7$

1. Find f(-5) $= (-5)^2 - 3(-5) =$

$25+15 = 40$

2. Find g(2)

$2-7$

-5

3. Find f(g(2))

$f(-5) = 40$

Composite Functions:

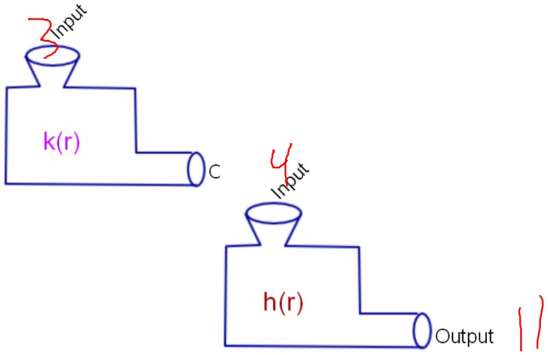
"f of g of x"

$f(g(x))$ same as $(f \circ g)(x)$

Substitute function g into function f

given: h(r) = 3r-1 k(r) = r + 1

find h(k(3))



Use these functions: $f(x) = x^2 + 3x$ $g(x) = 5x$

Find each. Simplify.

1. f(g(x))

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

$25x^2 + 15x$

2. $(g \circ f)(x)$

3. f(g(3))

4. $(g \circ f)(7)$