

Section 2.6 Operations on Functions; Composite Functions

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

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

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

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

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

ex: $f(x) = 2x^2 - x$

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

$$\begin{aligned} \text{a) } (f+g)(x) &= 2x^2 - x + 2x^2 + x \\ &= 4x^2 \end{aligned}$$

$$\begin{aligned} \text{b) } (f-g)(x) &= (2x^2 - x) - (2x^2 + x) \\ &= \cancel{2x^2} - x - \cancel{2x^2} - x \\ &= -2x \end{aligned}$$

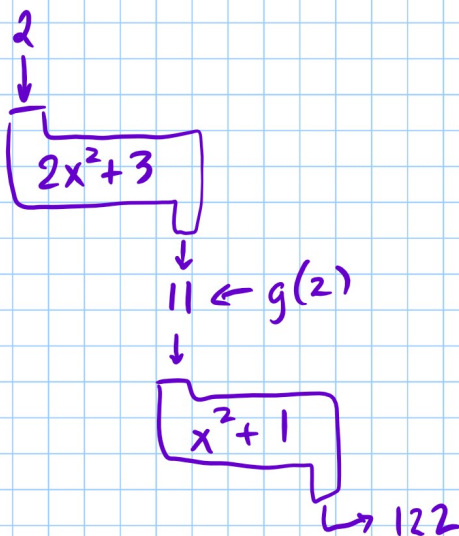
$$\begin{aligned} \text{d) } \left(\frac{f}{g}\right)(x) &= \frac{2x^2 - x}{2x^2 + x} = \frac{x(2x-1)}{x(2x+1)} \\ &= \frac{2x-1}{2x+1} \end{aligned}$$

$$\begin{aligned} \text{c) } (f \cdot g)(x) &= (2x^2 - x)(2x^2 + x) \\ &= 4x^4 + \cancel{2x^3} - \cancel{2x^3} - x^2 \\ &= 4x^4 - x^2 \\ &= x^2(4x^2 - 1) \end{aligned}$$

	$2x^2$	$-x$
$2x^2$	$4x^4$	$-2x^3$
x	$2x^3$	$-x^2$

ex: $f(x) = x^2 + 1$ $g(x) = 2x^2 + 3$

$$(f \circ g)(2) = f(\underbrace{2 \cdot 2^2 + 3}_{g(2)}) = f(11) = 11^2 + 1 = 122$$



$$\begin{aligned} (g \circ f)(2) &= g(\underbrace{2^2 + 1}_{f(2)}) = g(5) = 2 \cdot 5^2 + 3 \\ &= 2 \cdot 25 + 3 \\ &= 53 \end{aligned}$$

$$(f \circ f)(-1) = f((-1)^2 + 1) = f(2) = 2^2 + 1 = 5$$

$$(f \circ g)(x) = f(\underbrace{2x^2+3}_{g(x)}) = (2x^2+3)^2 + 1$$
$$= 4x^4 + 12x^2 + 10$$

	$2x^2$	3
$2x^2$	$4x^4$	$6x^2$
3	$6x^2$	9

In this assignment, don't find domain

p155-156 1, 11, 12, 13, 19, 33, 41, 51, 55
40 (BONUS)