8.1 Combinations of functions

Review: If $f(x) = 2x^2 + 3x - 7$ and $g(x) = -4x^2 - 7x + 2$, what is $f(x) + g(x)$?

$(2x^2 + 3x - 7) + (-4x^2 - 7x + 2)$

$-2x^2 - 4x - 5$

Shortcuts:

1. Sum: $(f+g)(x) = f(x) + g(x)$
2. difference: $(f-g)(x) = f(x) - g(x)$
3. product: $(f \cdot g)(x) = f(x) \cdot g(x)$
4. quotient: $\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}$

Ex: let $f(x) = x+3$ and $g(x) = x^2+2x-4$.

Find: $(f+g)(x)$ $\quad f(x) = 2x-4$

$(x+3) + (x^2+2x-4)$

x^2+3x-1

$(f-g)(-1)$

$(x+3) + (-x^2+2x+4)$

$-x^2 - x + 7$

$-(-1)^2 - (-1) + 7$

$-1 + 1 + 7 = 7$

$(fg)(x) = (x+3)(x^2+2x-4)$

$x^3+2x^2-4x+3x^2+6x-12$

$x^3+5x^2+2x-12$

$\left(\frac{g}{f}\right)(0) = \frac{x^2+2x-4}{x+3}$

$= \frac{(0)^2+2(0)-4}{0+3}$

$= \frac{-4}{3}$

p. 506
1-20 all