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Section 1.5 Combinations of Functions p.51

Obj: 1. TSW Add, Subtract, multiply & divide functions.
2. TSW Find the composition of two functions.
3. TSW Use combinations of functions to model real-life.

Operations with Functions

1. Sum: $(f+g)(x) = f(x) + g(x)$
2. Difference: $(f-g)(x) = f(x) - g(x)$
3. Product: $(fg)(x) = f(x) \cdot g(x)$
4. Quotient: $\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}, \; g(x) \neq 0$

The domain of an arithmetic **combination** of functions f and g consists of $\mathbb{R}$ that are common to the domains of f and g. In the case of the quotient $f(x)/g(x)$ $g(x) \neq 0$.

Ex:1 Given $f(x) = 2x+1$ and $g(x) = x^2 + 2x - 1$
find $(f+g)(x)$.

$$(f+g)(x) = f(x) + g(x) = 2x+1 + x^2 + 2x - 1$$
$$= x^2 + 4x$$

Note:

$(f+g)(2)$
$(2)^2 + 4(2)$
$4 + 8$

$(f+g)(2) = 12$

Ex: 2 Given $f(x) = 2x+1$ $g(x) = x^2 + 2x - 1$
find $(f-g)(x)$.

$$(f-g)(x) = (2x+1) - (x^2 + 2x - 1)$$
$$= 2x + 1 - x^2 - 2x + 1$$
$$= -x^2 + 2$$