

10.1 Sum and Differences of Functions

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

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

Example 1:

Consider the functions:

$$f(x) = 2x + 1$$

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

- Determine the equation of the function $h(x) = (f + g)(x)$
- Use a table of values (same table) to sketch the graphs of $f(x)$, $g(x)$ and $h(x)$. What do you notice?
- State the domain and range of $h(x)$. Is it the same as the domain and range of the two other functions?

10.2 Products and Quotients of Functions

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

$$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)} \text{ Note: } g(x) \neq 0$$

Example 2:

Consider the functions:

$$f(x) = 2x - 6$$

$$g(x) = x^2 - x - 6$$

- a.) Determine the equation of the function $h(x) = \left(\frac{f}{g}\right)(x)$
- b.) Determine the domain and range of the function $h(x)$

To combine functions:

-Add , subtract, divide or multiply the y values for each given x value on the domain.

-domain on of $f(x)$ and $g(x)$ should also be included in the final result.

-extra restrictions when dividing

Example 3: Find $h(x)$ and state the domain of $h(x)$ given:

a.) $h(x) = f(x) + g(x)$ if $f(x) = 5 + \frac{5}{x}$ and $g(x) = 3x - \frac{5}{x}$

b.) $h(x) = (f \cdot g)(x)$ if $f(x) = \sqrt{x + 2}$ and $g(x) = \sqrt{4x + 8}$

Homework:

p483 1-11, p496 1-10