Section 4.5 notes

Objective: Combining Functions with Arithmetic

It can be useful to combine two functions to make a new function. For instance, you may have a function describing the revenue from a product and a function describing the costs of producing the product. By subtracting the two functions, you can create a function describing the profit made from the product.

Tips:

- Use parentheses carefully. Write each function in parentheses.
- Be careful with negatives. If there is a negative outside parentheses, it changes the sign of *everything* inside the parentheses.
- When adding or subtracting, combine like terms.
- When multiplying, distribute or FOIL and make sure to use exponent rules correctly.

Examples: Let f(x) = 3x - 5 and $g(x) = x^2 + 5x - 2$.

Perform the indicated operations.

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

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

$$x^2 + 8x - 7$$
b) $h(x) = f(x) - g(x)$

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

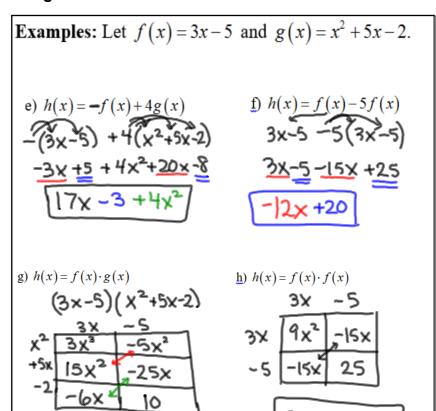
$$3x - 5 - x^2 - 5x + 2$$

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

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

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

 $\chi^2 + 5 \times -2 - (3 \times -5)$
 $\chi^2 + 5 \times -2 - 3 \times +5$
 $\chi^2 + 5 \times -2 - 3 \times +5$
 $\chi^2 + 2 \times +3$
d) $h(x) = 2f(x) + 3g(x)$
 $\chi^2 + 5 \times -2 - 3 \times +5$
 $\chi^2 + 2 \times -16 + 3 \times^2$
 $\chi^2 + 2 \times -16$
 $\chi^2 + 2 \times -16$



Evaluating Combined Functions

3x3+10x2-31x+10

To evaluate a combined function for certain values of x, replace x with the specified number in each function, then add, subtract, multiply or divide. Make sure to follow order of operations!

Examples: Let f(x) = 2x - 7, and let $g(x) = -x^2 + 3$.

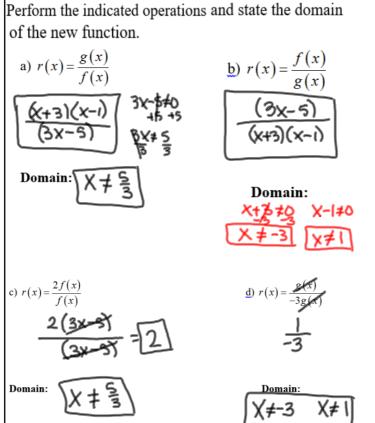
Evaluate the following.

Evaluate the following.

b)
$$f(0) - g(-3)$$
 $2 \times -7 - 2 + 3$
 $2(2) -7 - (1)^2 + 3$
 $-3 + 2$

c) $f(-2) \cdot 3g(2)$
 $2 \times -7 - 2 + 3$
 $2(-2) -7 - (2)^2 + 3$
 $-11 - 3$
 $3(-1)$

Examples: Let
$$f(x) = 3x - 5$$
 and $g(x) = (x+3)(x-1)$
Perform the indicated operations and state the domain of the new function



Examples: Let
$$f(x) = 3x - 5$$
 and $g(x) = (x + 3)(x - 1)$

Evaluate the following functions with the given values and functions.

