TOPIC: FUNCTION OPERATIONS
Adding & Subtracting Functions

- We add & subtract functions *exactly* how we add & subtract polynomials. Simply combine like terms.

Adding & Subtracting Polynomials	Adding & Subtracting Functions
$x^2 + 4$ $+ \ (5x + 7)$	$f(x) = \ x^2 + 4$ $g(x) = \ 5x + 7$ $f(x) + g(x) =$

Note: You may also see $f(x) + g(x)$ written as _____ and $f(x) - g(x)$ written as _____.

- Domain of $f + g$ or $f - g$ is all the numbers that are _____ between the domains of f&g independently.

EXAMPLE: Given the functions, $f(x) = x^2 + \frac{1}{x}$, $g(x) = x^2 + x + 2$, $h(x) = x + \sqrt{x - 8}$, complete the following operations below. Determine the domain of each new function.

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

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

Domain of f: _____

Domain of g: _____

Domain of $(f + g)$: _____

Domain of g: _____

Domain of h: _____

Domain of $(g - h)$: _____

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PROBLEM: If $f(x) = \sqrt{x+4} + 30$ and $g(x) = \sqrt{x+4} - 2x + 35$ complete the following operation below. Determine the domain of the new function.

(A)

$(f + g)(x)$ =

(B)

$(f - g)(x)$ =

TOPIC: FUNCTION OPERATIONS
Multiplying And Dividing Functions

- You may be asked to multiply or divide functions and find the _____ of the resulting function.

Multiplying Functions	Dividing Functions
$f(x) = \sqrt{x}$ **Dom:** [___, ___) $g(x) = (3x - 6)$ **Dom:** (___, ___) $f(x) \cdot g(x) =$ **Dom:** [___, ___) Domain: Set of numbers *common* to domains of f & g	$f(x) = \sqrt{x}$ **Dom:** [___, ___) $g(x) = (3x - 6)$ **Dom:** [___, ___) $\frac{f(x)}{g(x)} =$ **Dom:** [___,___)∪(___, ___) Domain: Set of numbers *common* to domains of f & g AND where $g(x) \neq$ ___

Note: You may also see $f(x) \cdot g(x)$ written as _____ and $\frac{f(x)}{g(x)}$ written as _____.

EXAMPLE: Given the functions, $f(x) = x^2 - 4$, $g(x) = x + 2$, complete the following operations below, and determine the domain of the new function.

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

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

- Always determine the domain restrictions _____ simplifying the functions.

TOPIC: FUNCTION OPERATIONS

PRACTICE: Given the functions $h(x) = 2x^3 - 4$ and $k(x) = x^2 + 2$, find and fully simplify $h \cdot k(x)$.

PRACTICE: Given the functions $L(x) = x - 2$ and $M(x) = x^2$, calculate $\frac{L}{M}(5)$.