Review:

1. Graph: $p(x) = \begin{cases} x, & \text{if } x < 2 \\ |x - 2|, & \text{if } x = 2 \\ x + 1, & \text{if } 2 < x < 5 \\ -1, & \text{if } x \ge 5 \end{cases}$

2. Odd, even, or neither? Show your work, leave no ().

a)
$$f(x) = -\frac{2x}{\sqrt{5+x^2}}$$
 b) $g(x) = 3x^3 + x - 2$

3. Find the domain in interval notation:

$$f(x) = \frac{3x}{\sqrt{9 - x^2}}$$

Sec. 1.7 Arithmetic Combinations of Functions 4 Basic Operations:

Given *f*(*x*) and *g*(*x*):

Sum: (f+g)(x) = f(x) + g(x)

Difference: $(f-g)(\mathbf{x}) = f(\mathbf{x}) - g(\mathbf{x})$

Product:

 $(fg)(\mathbf{x}) = f(\mathbf{x})g(\mathbf{x})$

Quotient:

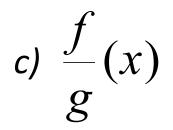
 $\frac{f}{g}(x) = \frac{f(x)}{g(x)}, \text{ provided } g(x) \neq 0.$

Ex. 1: If f(x) = 2x + 6 and $g(x) = x^2 + 5x + 6$ find:

a) (f - g)(x)

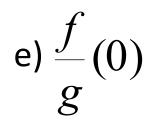
a)
$$(f-g)(0)$$

$$f(x) = 2x+6$$
 $g(x) = x^2+5x+6$



d)
$$\frac{f}{g}(-3)$$

$$f(x) = 2x+6$$
 $g(x) = x^2+5x+6$



Sec. 1.7 Composite Functions

 $(f \circ g)(\mathbf{x}) = f(g(\mathbf{x}))$: Read as "f of $g(\mathbf{x})$ "

Means: all of the x's in the f function are replaced by the equation of g(x)

Vice versa for (*g o f*)(*x*).

Finding the Domain

For Operations: +, −, ×, ÷	For Composition: f o g & g o f
The domain comes from all the functions involved and the result.	The overall domain includes both the result's and the "inside" function's domain restrictions. NOT THE OUTSIDE FUNCTION!

Ex.1: If
$$f(x) = \frac{2}{x+3}$$
 and $g(x) = \frac{1}{x}$

Find *f* o *g* and its domain.

Ex. 2: If
$$f(x) = \sqrt{x}$$
 and $g(x) = x^2 + 3$,

a) Find *g* o *f* and its domain.

b) Find *g o f* (4)

c) Find *g* o *f* (-1)

Ex. 3: If
$$f(x) = \frac{1}{x}$$
 and $g(x) = \frac{1}{2x+1}$,

Find *f* o *g* and its domain.