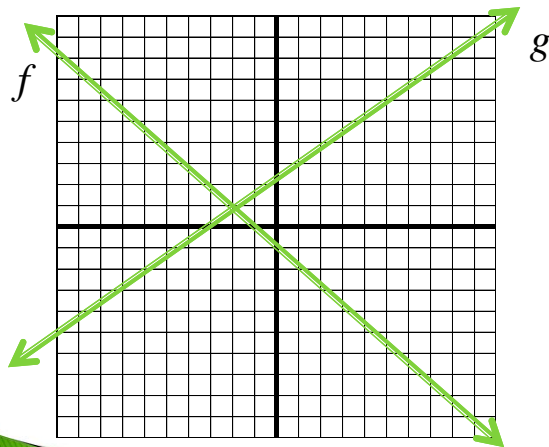


1-4: Building Functions from Functions

Honors Precalculus
Mr. Gallo

I. Graphically

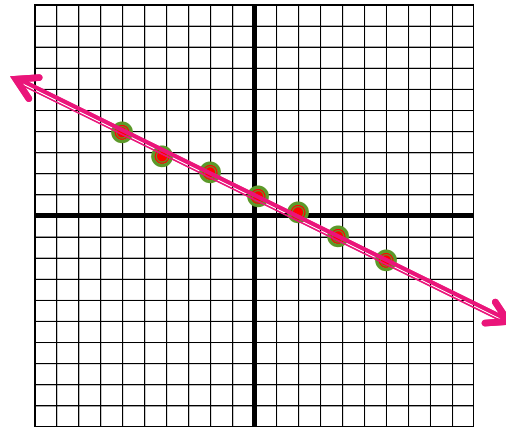
A.) Given f and g , find the following:



- 1.) $f + g$
- 2.) $f - g$
- 3.) $f(g)$
- 4.) $\frac{f}{g}$

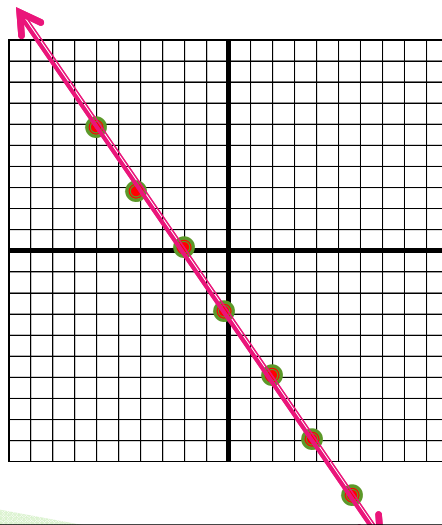
1.) $f + g$

x	f	g	$f+g$
-6	5	-1	4
-4	3	0	3
-2	1	1	2
0	-1	2	1
2	-3	3	0
4	-5	4	-1
6	-7	5	-2



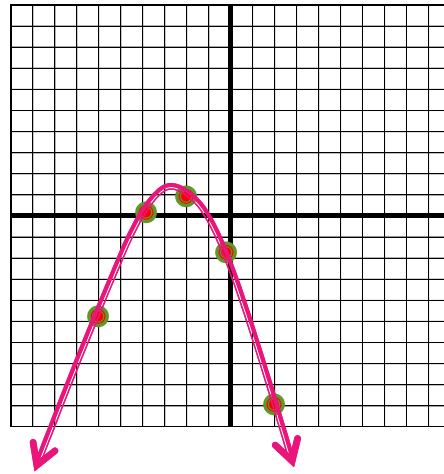
2.) $f - g$

x	f	g	$f-g$
-6	5	-1	6
-4	3	0	3
-2	1	1	0
0	-1	2	-3
2	-3	3	-6
4	-5	4	-9
6	-7	5	-12



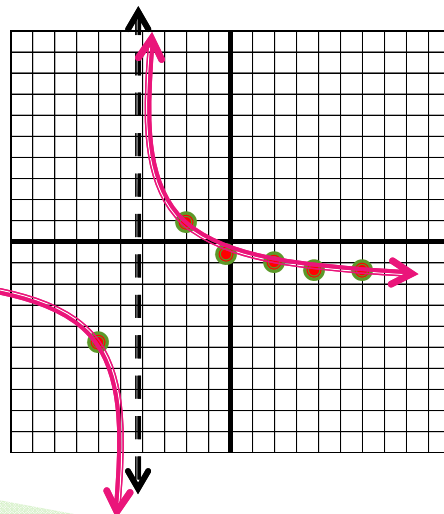
3.) fg

x	f	g	fg
-6	5	-1	-5
-4	3	0	0
-2	1	1	1
0	-1	2	-2
2	-3	3	-9
4	-5	4	-20
6	-7	5	-35



4.) $\frac{f}{g}$

x	f	g	f/g
-6	5	-1	-5
-4	3	0	VA
-2	1	1	1
0	-1	2	-1/2
2	-3	3	-1
4	-5	4	-1.25
6	-7	5	-1.4



II. Algebraic Combinations

A.) Let f and g be two functions with intersecting domains

1.) Sum $(f + g)(x) = \underline{f(x) + g(x)}$

2.) Difference $(f - g)(x) = \underline{f(x) - g(x)}$

3.) Product $(fg)(x) = \underline{f(x) \cdot g(x)}$

4.) Quotient $(f/g)(x) = \underline{\frac{f(x)}{g(x)}, \text{ for } g(x) \neq 0}$

Given f and g below, find the following formulas and

domains: $f(x) = 2x + 1$ $g(x) = \sqrt{x}$

1) $(f + g)(x) = \underline{2x + \sqrt{x} + 1} \quad [0, \infty)$

2) $(f - g)(x) = \underline{2x - \sqrt{x} + 1} \quad [0, \infty)$

3) $(fg)(x) = \underline{2x\sqrt{x} + \sqrt{x}} \quad [0, \infty)$

4) $(f/g)(x) = \underline{\frac{2x+1}{\sqrt{x}}} \quad (0, \infty)$

5) $(gg)(x) = \underline{x} \quad [0, \infty)$

III. Composing Functions

- ▶ Let f and g be two functions such that the domain of f intersects the range of g . The composition f of g , denoted $f \circ g$, is defined by the rule:

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

- ▶ The domain of $f \circ g$ consists of all x -values in the domain of g that map to $g(x)$ values in the domain of f .

Given f and g below, find the following formulas and domains: $f(x) = x^2$ $g(x) = \sqrt{x}$

1) $(f \circ g)(x) = \frac{(\sqrt{x})^2 = x}{\quad} \quad [0, \infty)$

2) $(g \circ f)(x) = \frac{\sqrt{x^2} = |x|}{\quad} \quad (-\infty, \infty)$

IV. Decomposing Functions

For each composite function h , find functions f and g such that:

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

$$h(x) = 3(x-1)^2 + 2(x-1) + 6$$

$$g(x) = x - 1$$

$$f(x) = 3x^2 + 2x + 6$$

$$h(x) = e^{3x+1}$$

$$g(x) = 3x + 1$$

$$f(x) = e^x$$

Homework: p.116: #3,6,9,11,13, 15-29 odd