Wednesday, October 18, 2017
6:21 PM

Precalculus
1.6 – 1.8 Review

Name: KEY
Period: _____ **Date:** _____

In Exercises 1–2, find a) $(f+g)(x)$, b) $(f-g)(x)$, c) $(fg)(x)$, d) $(f/g)(x)$. What is the domain of f/g?

1. $f(x)=2x-5$ and $g(x)=2-x$

1a) $2x-5+2-x$
$=x-3$

1b) $2x-5-(2-x)=$
$3x-7$

1c) $(2x-5)(2-x)=$
$4x-2x^2-10+5x$
$=-2x^2+9x-10$

1d) $\frac{2x-5}{2-x}$
$x-2\neq 0$
$x\neq 2$
D: $(-\infty,2)\cup(2,\infty)$

2. $f(x)=x^2-1$ and $g(x)=\sqrt{3-x}$

2a) $x^2-1+\sqrt{3-x}$

2b) $x^2-1-\sqrt{3-x}$

2c) $(x^2-1)(\sqrt{3-x})$

2d) $\frac{x^2-1}{\sqrt{3-x}}$
$3-x>0$
$-x>-3$
$x<3$
$(-\infty,3)$

In Exercises 3–4, find a) $f\circ g$, b) $g\circ f$, c) $f\circ f$, d) $g\circ g$.

3. $f(x)=x^2+2$ and $g(x)=3-x$

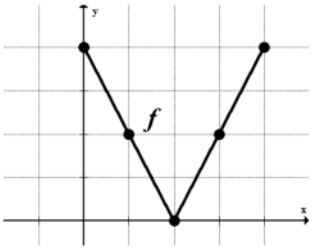
3a) $f(g(x))=(3-x)^2+2=(3-x)(3-x)+2$
$=9-6x+x^2+2$
$=x^2-6x+11$

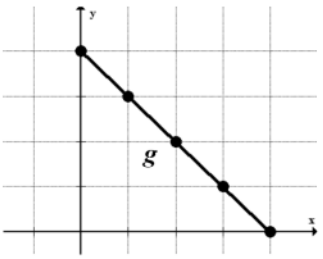
3b) $g(f(x))=3-(x^2+2)$
$=3-x^2-2$
$=-x^2+1$

3c) $f(f(x))=(x^2+2)^2+2$
$=(x^2+2)(x^2+2)+2$
$=x^4+4x^2+4+2$
$=x^4+4x^2+6$

3d) $g(g(x))=3-(3-x)$
$=3-3+x$
$=x$

In Exercises 4–11, use the graphs of f and g to evaluate the functions.





4) $(f+g)(1)$
$f(1)+g(1)=$
$2+3=$
5

5) $(fg)(3)$
$f(3)\cdot g(3)=$
$2\cdot 1=$
2

6) $(f\circ g)(2)$
$g(2)=2$
$f(2)=0$

7) $(g\circ f)(4)$
$f(4)=4$
$g(4)=0$

8) $(g-f)(0)$
$g(0)-f(0)=$
$4-4=$
0

9) $\left(\frac{g}{f}\right)(4)$
$\frac{g(4)}{f(4)}=\frac{0}{4}=0$

10) $(f\circ f)(2)$
$f(2)=0$
$f(0)=4$

11) $(g\circ g)(3)$
$g(3)=1$
$g(1)=3$

In Exercises 12 – 13, write an equation for the function that has

12) the parent graph $f(x) = [\![x]\!]$

stretched twice vertically
reflected in the y-axis
shifted 3 units to the right and 1 units upward

$h(x) = 2[\![-(x-3)]\!] + 1$

13) the parent graph $f(x) = |x|$

shrunk horizontally with coefficient 3
reflected in the x-axis
shifted 2 units to the left and 1 units downward

$K(x) = -|3(x+2)| - 1$

In Exercises 14 –15, identify the parent function and describe the sequence of transformations. Sketch the graph for each of the transformed functions. **DO NOT USE A CALCULATOR!!!**

14). $f(x) = -(-x+1)^2$

$P(x) = x^2$

$= -(-(x-1))^2$

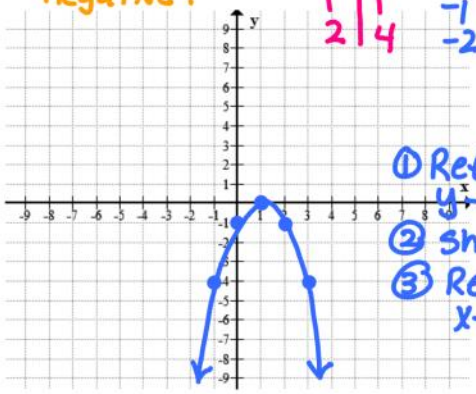
③ ① ②

* FACTOR OUT negative !

x	y
-2	4
-1	1
0	0
1	1
2	4

① (-1)x	② x+1	③ (-1)y
2	3	-4
1	2	-1
0	1	0
-1	0	-1
-2	-1	-4

x y



① Reflect over y-axis
② Shift 1 Rt
③ Reflect over x-axis

15). $f(x) = 3\sqrt{1-x} - 4$

$P(x) = \sqrt{x}$

$= 3\sqrt{-x+1} - 4$

$= 3\sqrt{-(x-1)} - 4$

③ ① ② ④

* FACTOR OUT negative !

x	y
0	0
1	1
4	2
9	3

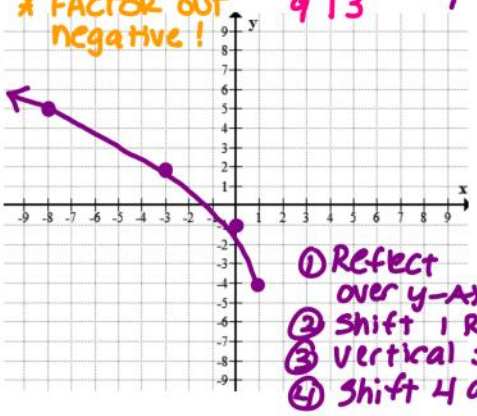
① X(-1)	② X+1	③ 3(y)
0	1	0
-1	0	3
-4	-3	6
-9	-8	9

x

④

y-4
-4
-1
2
5

y



① Reflect over y-Axis
② Shift 1 RT
③ Vertical Stretch by 3
④ Shift 4 down

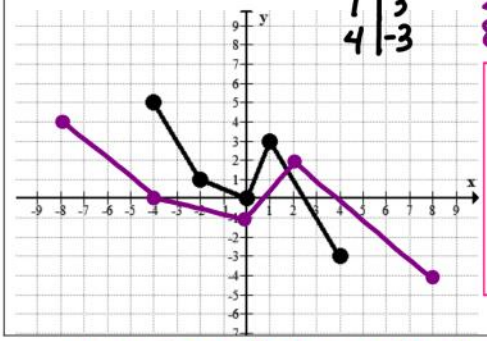
In Exercises 16–17, use the graph of f below to sketch the graph of g (on the same set of axes). List your ordered pairs for each!

16). $g(x) = f\left(\frac{1}{2}x\right) - 1$

* Reciprocal

x	y
-4	5
-2	1
0	0
1	3
4	-3

2(x)	y-1
-8	4
-4	0
0	-1
2	2
8	-4



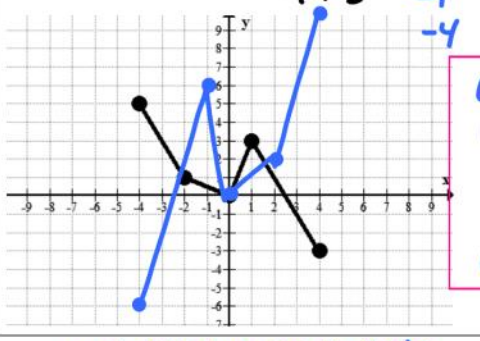
(-8,4)
(-4,0)
(0,-1)
(2,2)
(8,-4)

* Horizontal stretch by 2
* Shift 1 down

17). $g(x) = 2f(-x)$

x	y
-4	5
-2	1
0	0
1	3
4	-3

(-1)x	2(y)
4	10
2	2
0	0
-1	6
-4	-6



(4,10)
(2,2)
(0,0)
(-1,6)
(-4,-6)

* Reflect over y-Axis
* Vertical Stretch by 2