C12 - Function Notation

$$y = f(x) = y$$

$f(x) = x + 2$

$$y = x + 2$$
$$y(3) = 3 + 2$$

$f(3) =?$ $(3, y)$

What is y when x is 3. Put 3 in for x.

$f(x) = x + 2$
$f(3) = 3 + 2$
$f(3) = 5$ $(3,5)$

Put whatever is inside the brackets in for x! So simple.

$f(x) = 6$ $(x, 6)$

What is x when y is 6. Put 6 in for f(x).

$f(x) = x + 2$
$6 = x + 2$
$-2 \quad\quad -2$
$4 = x$
$x = 4$ $(4,6)$

$f(x + 2) =?$

$f(x) = x + 2$
$f(x + 2) = (x + 2) + 2$
$f(x + 2) = x + 4$

Put x + 2 in for f's x

$f(2x) =?$

$f(x) = x + 2$
$f(2x) = (2x) + 2$
$f(2x) = 2x + 2$

Put 2x in for f's x

C12 - 10.1 - Composite Function Notes

$f(x) = x + 1$ $g(x) = 2x$

What is $g(f(x))$?

$g(f(x)) =$
$g(x + 1) =$ Put $f(x)$ into $g's$ x.
$2(x + 1) = 2x + 2$

What is $f(g(x))$?

$f(g(x)) =$
$f(2x) =$ Put $g(x)$ into $f's$ x.
$(2x) + 1 = 2x + 1$

$f(x) = x + 1$ $g(x) = 2x$

What is $f(g(2))$?

Substituting Numbers

$g(x) = 2x$
$g(2) = 2(2)$
$g(2) = 4$
$\downarrow$

Find out what $g(2)$ equals.
Then substitute into $f(x)$

$f(x) = x + 1$
$f(4) = 4 + 1$
$f(4) = 5$

$f(g(2)) = 5$

Substituting Equations

$f(g(x)) =$
$f(2x) = (2x) + 1$ *Find out what $f(g(x))$ is.*
Then substitute x value
$= 2(2) + 1$ *into equation.*
$= 5$

$f(g(2)) = 5$

$g(x) = x - 1$ $f(g(x)) = (x - 1)^2$ $f(x) = ?$

If $g(x) = x - 1$, What would $f(x)$ need to be in order for $f(g(x)) = (x - 1)^2$

Ask yourself: What would $f(x)$ need to be so when I substitute $g(x)$ in for x we will get $(x - 1)^2$

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

Or

$g(x)?$ $f(x) = ?$

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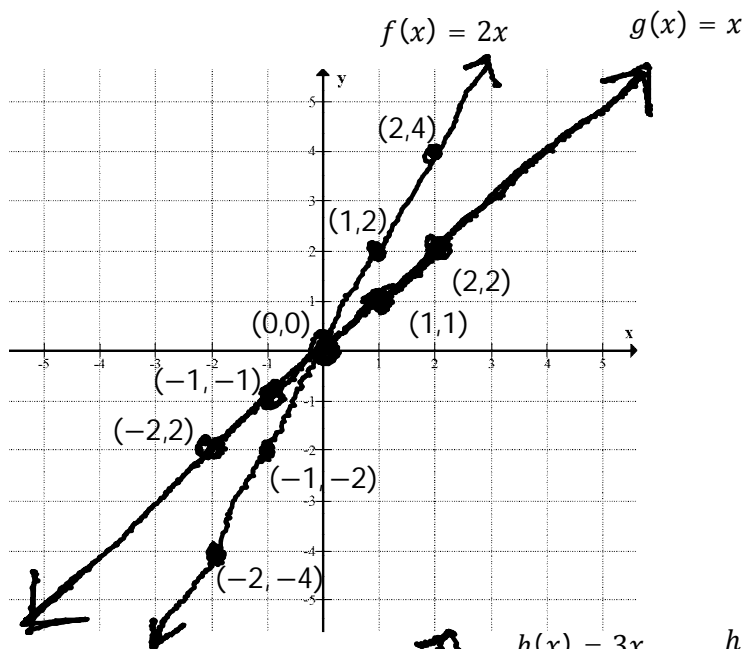

$f(x) = x^2$ $f(g(x)) = x^2 - 6x + 9$ $g(x) = ?$

$f(g(x)) = (x - 3)(x - 3)$
$f(g(x)) = (x - 3)^2$
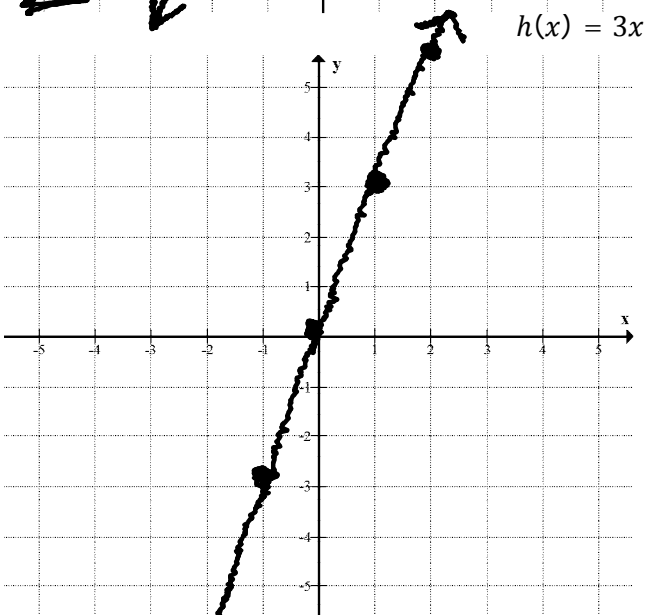
$g(x) = x - 3$

C12 - 10.2 - Composite Graphs Notes

$f(x) = 2x$ $g(x) = x$

(2,4)
(1,2)
(2,2)
(0,0)
(1,1)
(−1,−1)
(−2,2)
(−1,−2)
(−2,−4)

$y = 2x$

x	f(x)
-2	-4
0	0
2	4

$y = x$

x	g(x)
-2	-2
0	0
2	2

$h(x) = 3x$

$h(x) = f(x) + g(x)$
$ = (2x) + (x)$
$h(x) = 3x$

Don't forget to substitute with brackets incase you have to distribute a negative when subtracting.

x	f(x)	g(x)	f(x)+g(x)
-2	-4	-2	-6
0	0	0	0
2	4	2	-6

Add y − values

$y = 2x^2$ $m(x) = 2x^2$
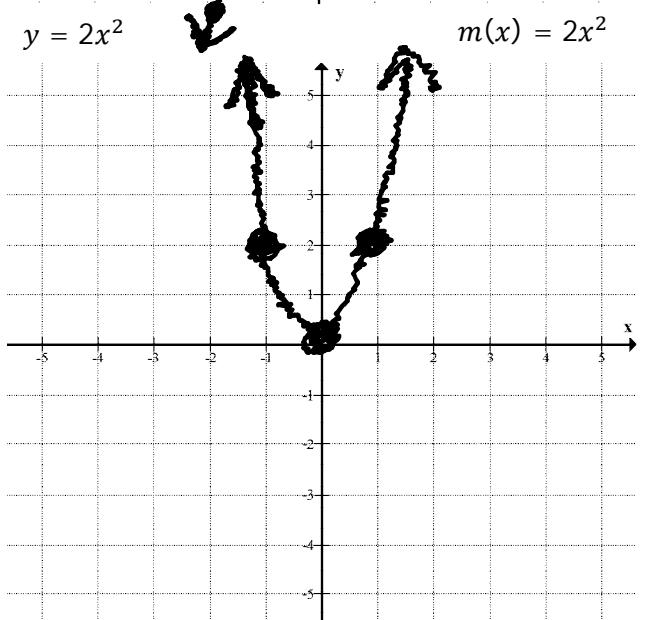
$m(x) = f(x)g(x)$
$ = (2x)(x)$
$m(x) = 2x^2$

x	f(x)	g(x)	f(x)×g(x)
-1	-2	-1	2
0	0	0	0
1	2	1	2

Multiply y − values