

## Questions on 3.4?

We will be taking our content mastery quiz shortly!

## Content Mastery Quiz - Lesson 3.4

**\*Show all work for full credit\***

The photography club tracks the number of photos its members have published in the school paper over the course of one year. The total number of photos published can be represented by the expression,  $2m^2 - 5$ . The table lists the total number of photos published.

Copy and fill  
in the table.

$$2m^2 - 5$$

Time Since Start of Year (months)	Total Number of Photos Published
	3
	13
4	
5	
6	

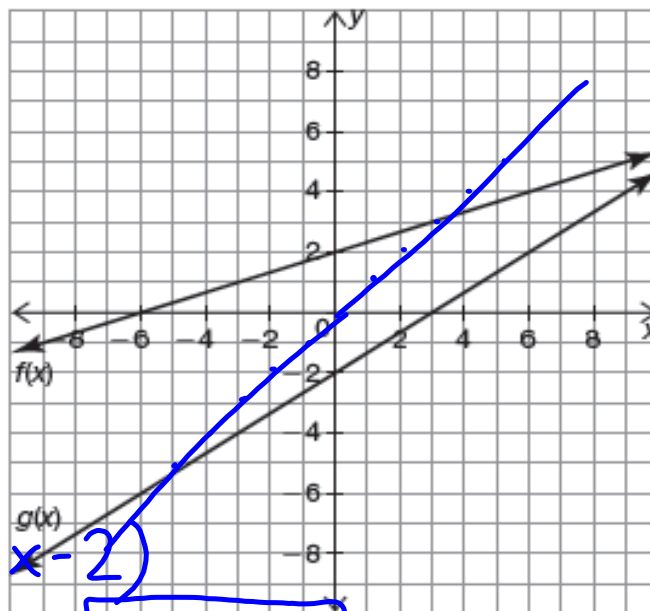
# I've Created a Monster, $m(x)$

## Analyzing Graphs to Build New Functions

3.5

### NOT IN YOUR BOOK

1. Analyze the graphs of the functions  $f(x)$  and  $g(x)$ .



$$f(x) = \frac{1}{3}x + 2$$

$$g(x) = \frac{2}{3}x - 2$$

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

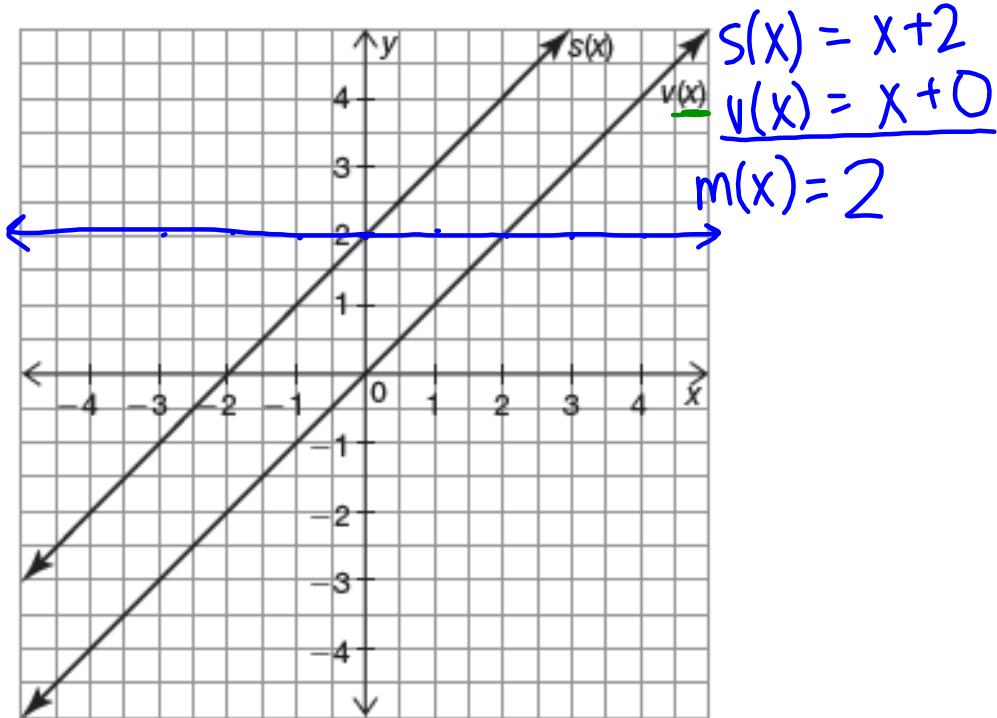
$$h(x) = \left(\frac{1}{3}x + 2\right) + \left(\frac{2}{3}x - 2\right)$$

$$h(x) = x + 0 \rightarrow \boxed{h(x) = x}$$

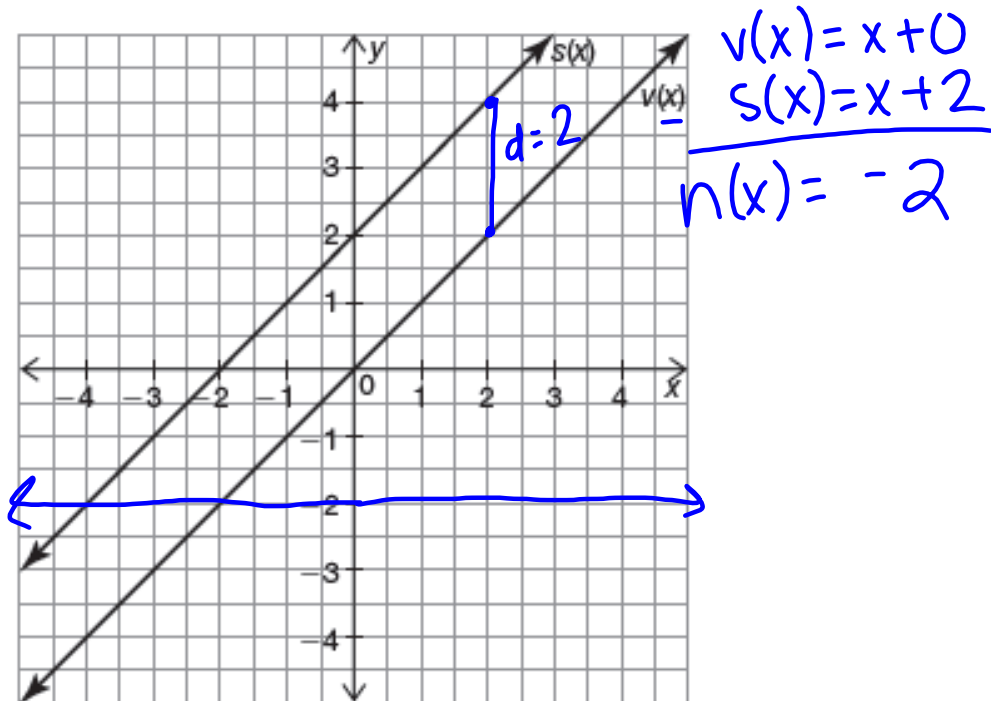
- Predict the function family of  $h(x) = f(x) + g(x)$ . Explain your reasoning.
- Plot 3 points that will lie on the graph of  $h(x)$ .
- Determine the equations of the functions  $f(x)$  and  $g(x)$ .
- Determine the equation of the function  $h(x) = f(x) + g(x)$ . Then, graph  $h(x)$ .
- Does  $h(x)$  belong to the function family you predicted? Does the graph of  $h(x)$  pass through the 3 points you plotted?

PG.173 IN YOUR BOOK

c. Sketch the graph of  $m(x)$  if  $m(x) = s(x) - v(x)$ .



d. Sketch the graph of  $n(x)$  if  $n(x) = v(x) - s(x)$ .



e. Describe the shape of the graph when you subtract  $s(x)$  and  $v(x)$ . Will subtracting the output values of any two parallel lines have this same result? Explain your reasoning.

PG.178 IN YOUR BOOK

Just as you added and subtracted functions in the previous problems, you can also build functions through multiplication.

1. Analyze the graphs of  $f(x)$  and  $g(x)$ .

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

$h(x) = (2x+4)(-x-5)$

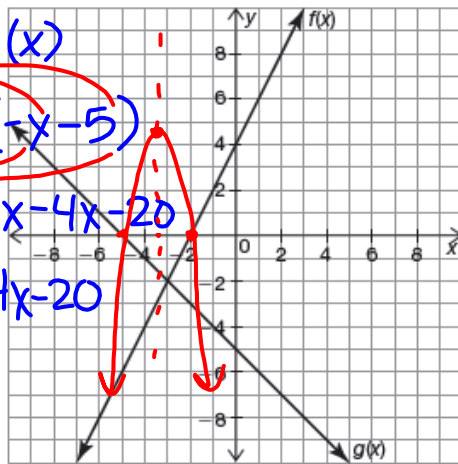
$h(x) = -2x^2 - 10x - 4x - 20$

$h(x) = -2x^2 - 14x - 20$

$2(x+2)(-x-5)$   
 $-2(x+2)(x+5)$

$f(x) = 2x+4$

$g(x) = -x-5$



You can use key points when multiplying just like you did when adding and subtracting.

a. Predict the function family of  $h(x)$  if  $h(x) = f(x) \cdot g(x)$ . Explain your reasoning.

b. Sketch the graph of  $h(x)$ . Show or explain your work.

c. Describe the differences between the graphs of  $f(x)$  and  $g(x)$  and the graph of  $h(x)$ .

d. Was your prediction in part (a) correct? What was the same/different after you multiplied the output values of key points?



2. You can analyze a table of values to determine the graphical behavior of functions.

a. Complete the table of values for  $h(x) = f(x) \cdot g(x)$ .

x	f(x)	g(x)	h(x)
-7	-10	2	-20
-6	-8	1	-8
-5	-6	0	0
-4	-4	-1	4
-3	-2	-2	4
-2	0	-3	0
-1	2	-4	-8
0	4	-5	-20

Can you see how the Identity and Zero Properties discussed in Problem 2 extend to multiplication?



b. What patterns do you notice in the table?

Graphs pg. 181-183

Homework

Finish lesson 3.5