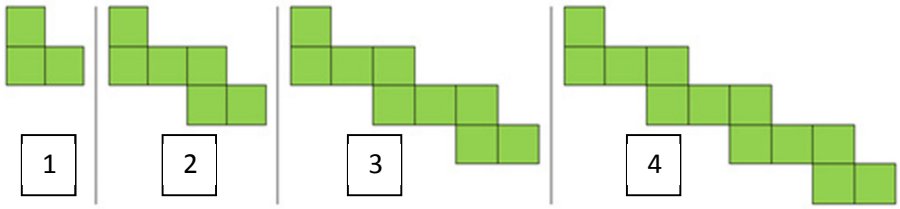
8A Adding & Subtracting Linear Functions

Name: _____Per: _____

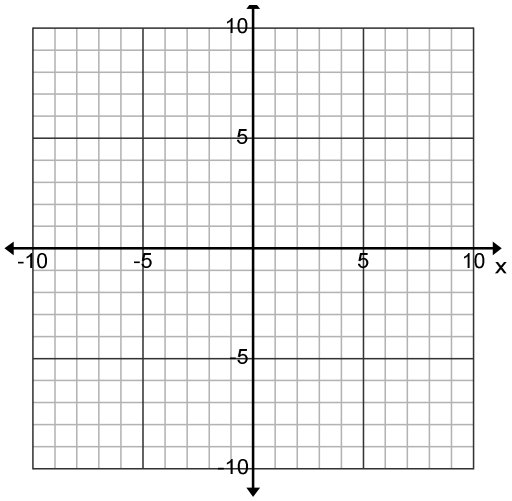
SHOW YOUR WORK AND WORK IN PENCIL

The following pattern represents f(x). The second table represents g(x).



x	$g(x)$
-2	1
0	-3
1	-5
5	-13

1. Find the equations for f(x) _____ and g(x) _____



   a. Graph f(x) and g(x) on the graph. Use different colors for the two graphs and label your lines.

   b. Complete the tables for f(x).

x	$f(x)$
-3	
-2	
1	
2	
5	

   c. What is $f(-2)$? _____ What is $f(1)$? _____

   e. What is $g(-2)$? _____ What is $g(-1)$? _____

   f. What is $f(-2) + g(-2)$? _____ What is $f(-2) + g(-1)$? _____

   g. Where does f(x) = g(x) on your graph? _____

   h. Show by substitution or elimination that your answer to the system is correct.

x	f(x)	g(x)	f(x)+ g(x)
-2			
-1			
0			
1			
2			
5			

   i. Combine your tables above to show the outputs for f(x) and g(x).

   j. Add the outputs to show f(x) + g(x).

   k. Using the table, find the equation for f(x) + g(x) _____.

   l. Graph your new function f(x) + g(x) in a different color above.

   m. How does the slope of the new equation compare to f(x) and g(x)?

   n. How does the y-intercept of the new equation compare to f(x) and g(x)?

   o. Write the equation for f(x) $-$ g(x) _____.

   p. How does the slope of the new equation compare to f(x) and g(x)?

   q. How does the y-intercept of the new equation compare to f(x) and g(x)?

   r. Graph your new function f(x) $-$ g(x) in a different color above.

   s. Explain how you found your equation.

2. If $f(x) = 3x + 5$ and $g(x) = -2x + 4$. SYW for each of the below.

a. $f(1)$ = _____ c. $f(1) + g(1)$ = _____ e. $f(x) + g(x)$ = _____

b. $g(1)$ = _____ d. $f(1) - g(1)$ = _____ f. $f(x) - g(x)$ = _____

3. If $f(x) = -5x + 8$ and $g(x) = 6x + 12$. SYW for each of the below.

a. $f(2)$ = _____ c. $f(x) + g(x)$ = _____ e. $f(2) + g(2)$ = _____

b. $g(2)$ = _____ d. $f(x) - g(x)$ = _____ f. $f(2) - g(2)$ = _____

4. Use the **non-linear data** from the table to answer the questions.

a. What is $a(-3) + b(-3)$?

b. What is $a(0) + b(0)$?

c. What is $a(0)b(0)$?

d. What is $a(7) - b(7)$?

e. What is $a(-1) + b(-1)$?

f. What is $a(-1)b(-1)$?

g. Find where $a(x) = 1$

h. Find where $b(x) = -5$

x	a(x)	b(x)
−3	1	−1
−1	7	−5
0	−3	−10
2	8	2
7	3	3

5. If $h(x) = 3x + 12$,

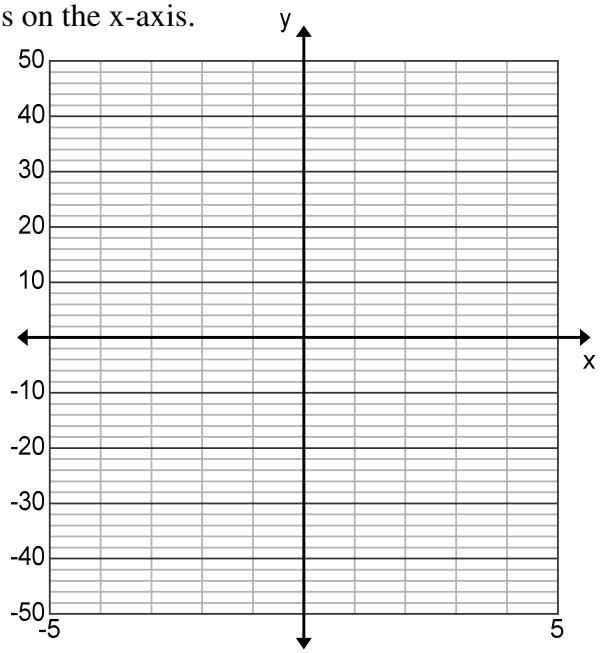
a. What is the slope? _____ Y-intercept? _____ X-intercept? _____

b. How could I change $h(x)$ to make each point on the line shift 5 units lower? _____

EC? How could I change $h(x)$ make each point on the line shift 3 units to the right? _____

6. Fill in the following table for three new functions. Count by 1's on the x-axis.

x	$f(x)$	$g(x)$	$f(x) + g(x)$	$f(x) - g(x)$	$f(x)g(x)$
–5	42	–12	30	54	–504
–3	30	–4		34	
–2	24	0			
0	12	8			
1	6	12	18		
3	–6	20			–120
5	–18	28			



a. What is $f(1)$? _____ What is $f(3)$? _____

b. **Find & graph** the equation for $f(x)$: _____

c. **Factor out the slope of** $f(x)$: _____

d. What is the **x-intercept** of $f(x)$**?** _____

e. What is $g(1)$? _____ Where is $g(x) = 20$? _____

f. **Find & graph** the equation for $g(x)$: _____

g. Graph $f(x)$ and $g(x)$ on the coordinate grid.

h. Find the equation for $f(x) + g(x)$: _____

i. **Graph $f(x) + g(x)$** on the coordinate grid in a different color.

j. Circle $f(1)$, $g(1)$, and $f(1) + g(1)$ on the graph.

k. How could you find the y-intercept for $f(x) - g(x)$ using only the graph?

l. How did you find your values for $f(x)g(x)$**?**