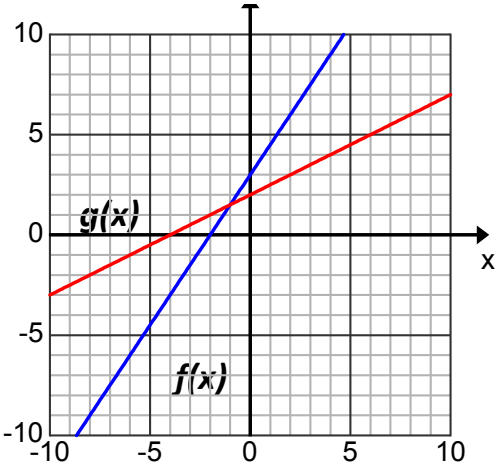
8.1H Function Addition & Subtraction

Name _____ Per: _____

SHOW YOUR WORK. WORK IN PENCIL.

1. Use the graph below of the functions to answer the following questions.
   a. Fill in the table using the graph below.
   b. Where does $f(x) = g(x)$? _____
   c. What is $f(2) + g(2)$? _____
   d. What is $f(4) + g(4)$? _____
   e. What is $g(-2) - f(-2)$? _____
   f. Write the equation for $f(x)$: _____
   g. Write the equation for $g(x)$: _____
   h. Over what interval is $g(x) > f(x)$? _____
   i. Sketch $f(x) + g(x)$ on the same grid and label.
   j. Sketch $f(x) - g(x)$ on the same grid and label.
   k. Write the equation for $f(x) + g(x)$: _____
   l. Write the equation for $f(x) - g(x)$: _____

x	f(x)	g(x)	f(x) + g(x)	f(x) – g(x)	f(x) g(x)
–6					
–2					
2					
4					



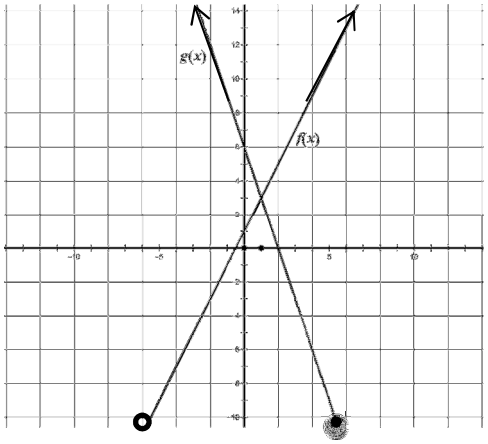
2. Use the table right to answer the questions.
   a. What is $a(-3) + b(-3)$? _____
   b. What is $a(-1) - b(-1)$? _____
   c. What is $a(0) + b(0)$? _____
   d. What is the Domain of a(x)? _____
   e. What is the Range of b(x)? _____
   f. Fill in columns for a(x) + b(x) and a(x) – b(x).
   g. Write the equation for a(x) + b(x) _____
   h. Write the equation for a(x) – b(x) _____

x	a(x)	b(x)	a(x) + b(x)	a(x) – b(x)
–3	1	–1		
–1	7	–5		
0	3	–7		
2	8	–11		
7	3	–19		

3. Use the table to the right to answer the following.
   a. Write the equations for the following functions.
      i. f(x)=_____
      ii. g(x)=_____.
   b. f(–2) + g(–2) = _____
   c. g(3) – f(3) = _____
   d. f(0) × g(0) = _____
   e. Write the equation for f(x) + g(x) = _____
   f. Write the equation for f(x) – g(x) = _____

x	$f(x)$	$g(x)$
–8	17	–18
–2	8	–12
0	5	–10
3	0.5	–7
6	–4	–4
10	–10	0

4. Complete the following based on the graph to the right.
   a. Where is $f(1)$? _____
   b. Where is $f(x) = -5$? _____
   c. Where is $g(-1)$? _____
   d. Where is $g(x) = -6$? _____
   e. What is the Domain of f(x)? _____
   f. What is the Range of g(x)? _____



5. Fill in the following table for the three new continuous functions:
   a. Find $f(-3)$: _____
   b. Find where $g(x) = 24$: _____
   c. Find the equation for $f(x)$: _____
   d. Find the equation for $g(x)$: _____
   e. Find the equation for $f(x) + g(x)$:
      _____
   f. Find the equation for $f(x) - g(x)$:
      _____
   g. Is $f(x) \times g(x)$ linear? _____
      Explain: _____
      _____

x	$f(x)$	$g(x)$	$f(x) + g(x)$	$f(x) - g(x)$	$f(x) \times g(x)$
–5	42	–12		54	–504
–4	36	–8			
–3	30	–4			
–2	24	0	24		
–1	18	4			
0	12	8		4	
1	6	12			
2	0	16			0
3	–6	20			
4	–12	24			
5	–18	28			

6. Given the equations $\boldsymbol{f(x) = 2x + 5}$ **and** $\boldsymbol{d(x) = 3x + 2}$**, find:**
   a. $f(2x) =$
   b. $d(2a + 3) =$
   c. $f(1) + d(1) =$
   d. $f(2) - d(2) =$
   e. Write the equation for $f(x) + d(x)$
   f. Write the equation for $f(x) - d(x)$
   g. Set up the equation for $f(x) \times d(x)$
   h. $f(2) \times d(2)$

7. Given the equation $\boldsymbol{f(x) = 4x + 12}$**.**
   a. Fill in the table of values using the equation.
   b. What is $f(-3)$? _____
   c. What is the slope of $f(x)$? _____
   d. What is the y-intercept (vertical shift) of $f(x)$? _____
   e. Factor out the slope to see the x-intercept of $f(x)$? _____
   f. Find the change that would happen to your equation if x became (x + 3).
      In other words, find $f(x + 3)$? _____
   g. What changes would happen to your graph from part f? _____
   h. How would you make all the points on the original line move down 8 units? _____
   i. Write the equation for your new line from part h: _____
   j. Factor out the slope in your equation that would show your new x-intercept _____

x	$f(x)$
-2	
-1	
0	
1	
2	
3	

8. **Construct** a line that is parallel to the line through the given point on the grid to the right. (Do not just count out the slope. Leave your construction marks.)
   a. Write the equation of your new line.
   b. What would be the equation of a line perpendicular to your new line and through the given point.