8D Functions Stretching & Shifting

Name:_____ Per:_____

SHOW YOUR WORK IN PENCIL

1. Use the functions in the graph to answer the questions.

a. Fill in the table for $f(x)$ and $g(x)$ from the graph below.

b. What is the slope for $f(x)$: _____

c. What is the y-intercept for $f(x)$:_____

d. Write the equation for $f(x)$: _____

e. From the graph, what is the x-intercept for $f(x)$: _____

f. What is the slope for $g(x)$:_____

g. What is the y-intercept for $g(x)$: _____

h. Write the equation for $g(x)$:_____

i. What's the x-intercept for $g(x)$ (look at the graph): _____

j. Where does $f(x) = g(x)$? _____

k. What is $f(-4) + g(-4)$? _____

l. Plot and graph $f(x) + g(x)$ on the grid and label.

m. Write the equation for $f(x) + g(x)$:_____

n. What kind of graph is made by $f(x) + g(x)$? _____

o. Plot and graph the points for $f(x)g(x)$ in another color.

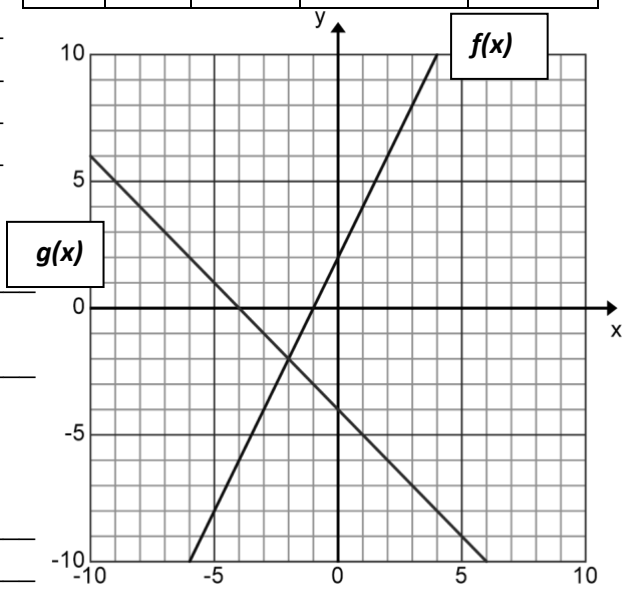
p. Write the expression for $f(x)g(x)$ as factors. _____

q. Multiply $f(x)g(x)$ by any method:

Write the equation: _____

r. What kind of graph is made by $f(x)g(x)$? _____

X	$f(x)$	$g(x)$	$f(x) + g(x)$	$f(x)g(x)$
–5				
–4				
–2				
–1				
0				
2				



EC: Factor out the slope to change $f(x)$ and expose the x-intercept [y = m(x + b/m)]_____

EC: Change $g(x)$ equation to show the x-intercept (like above):_____

2. Given the equation $f(x) = 4x + 12$ and **the parent graph $p(x) = x$:**

a. What is **vertical stretch (slope)** of $f(x)$?_____Where do you see this in the equation?_____

b. What is **vertical shift** of $f(x)$?_____Where do you see this in the equation?_____

c. Write the equation to make all the points on the line $f(x)$ move up 8 units?_____

d. How would the **vertical stretch** change in your new equation?

EC: Change your equation of $f(x)$ to expose the x-intercept by factoring out the slope? _____

EC: What is the horizontal shift of $f(x)$?_____ Where do you see this in the equation? _____

3. Compare the two equations $f(x) = 5x + 15$ and $d(x) = 3x + 6$

a. Which equation has the greatest vertical **stretch**? _____How do you know? _____

b. Which equation has the greatest vertical **shift**? _____How do you know? _____

EC: Factor the vertical stretch from $f(x)$: _____ and $d(x)$: _____

EC: Which equation has the greatest horizontal shifts **left**? _____ How do you know? _____

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

a. Find: $f(x) + g(x)$

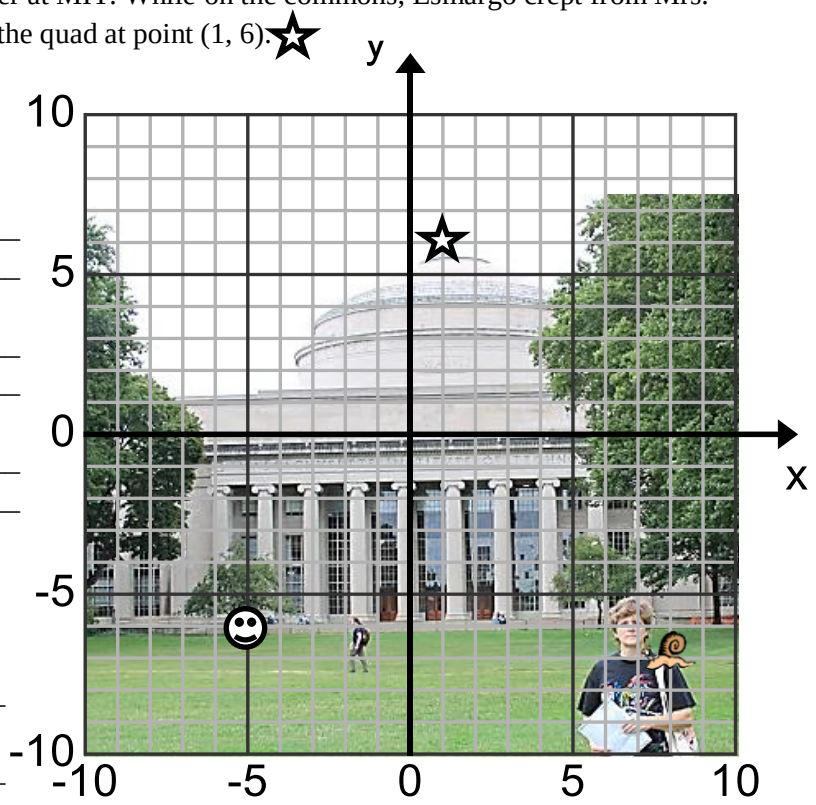
b. Find: $f(x) - g(x)$

c. Find: $g(x) - f(x)$

d. Find: $g(x)f(x)$

e. Find: $f(x)g(x)$

5. Mrs. Burton took her pet snail to Boston to enroll her at MIT. While on the commons, Esmargo crept from Mrs. Burton's shoulder (8, −7) to the top of the dome in the quad at point (1, 6).



a. Describe (using words) the path Esmargo took if she crept only horizontally and vertically from Mrs. Burton's shoulder to the top of the dome. _____

_____

b. Use numbers to describe what happens to the x-value? _____

c. List the horizontal shift _____

d. Use number to describe what happens to the y value? _____

e. List the vertical shift _____

f. From the top of the dome, Esmargo decided to rest in the shade under the little tree in front of the library at the left (at (−5, −6)). Describe her path (along the slope triangle).

_____

g. List the horizontal and vertical shifts that Esmargo travels. _____

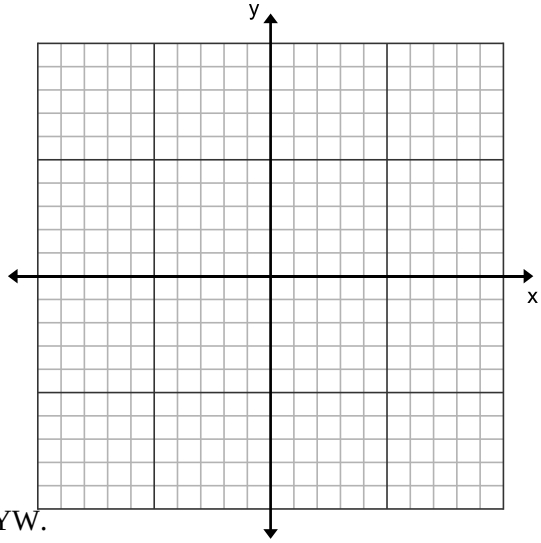
6. Given $f(x) = -x + 2$ and $g(x) = 2x - 6$ with the parent graph $p(x) = x$:

a. What is the **vertical stretch** of *f*(x) _____ **Vertical shift**? _____ EC. Horizontal shift? _____

b. What is the **vertical stretch** of *g*(x) _____ **Vertical shift**? _____ EC. Horizontal shift? _____

c. Complete the table for *f*(x), *g*(x), *f*(x) + *g*(x) and *f*(x)*g*(x)

X	*f*(x)	*g*(x)	*f*(x) + *g*(x)	*f*(x)*g*(x)
–2				
–1				
0				
1				
2				
3				



d. Graph and label the four functions on the grid.

e. Complete the equation for *f*(x) + *g*(x) =_____

f. Complete the equation for *f*(x)*g*(x) = _____

g. Use ***TWO METHODS*** to multiply your equation from part f. SYW.

No credit if this question is not done.

h. When you add two functions that are both lines, the resultant function is a _____

i. When you multiply two functions that are both lines, the resultant is a_____

j. Find $f(-2) =$ _____ Find $g(0)$ = _____ Find $f(-2) + g(0) =$ _____