Name:_____ Date:_____

Math 12 Enriched: HW Section 1.5 Combined Transformations

1. Indicate what the function $y = f(x)$ will become after each transformation in the specified order:

a) 1. Horizontal Shift of 3 units left 2. Horizontal expansion and reflection by a factor 3	b. 1. Horizontal Expansion and reflection by a factor of 3 2. Horizontal Shift of 3 lefts left
c) A vertical compression by a factor of -0.75 Vertical shift of 8 units up	d) Vertical shift of 8 units up and then a vertical compression by a factor of -0.75
e) A vertical expansion by a factor of 2 and then a reflection over the x-axis. Then a horizontal compression by a factor of 0.25.	f) A horizontal shift of 3 units left and 2 units up. Then a reflection on both axis. Then a HE of 3 and VC of 0.3.

2. When two transformations are performed in different orders, will the resulting function always be the same or always different? Explain:

3. The function $y = \sqrt{x}$ is horizontally expanded by a factor of 4. With what VE/VC will result in the same equation?

4. For what factor "K" will the transformation of $y = f(x) \rightarrow ky = f(x)$ transform the function from $y = x^2 \rightarrow y = (4x)^2$?

5. What is the transformation required to convert $y = (x-3)^2 \rightarrow y = (4x-12)^2$? Name two different sets of solutions:

6. Indicate all the transformations that is required to change from $y = f(x)$ to the equation give:

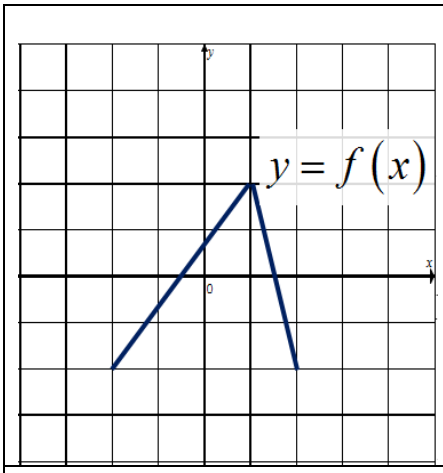
a) $y = 2f(3x-1)+1$	b) $y = -\frac{2}{3}f(3x+12)+1$
c) $y = 12-\frac{3}{5}f(8-2x)$	d) $\frac{1}{2}x = f(4y+1)$
e) $-0.\bar{2}y = f(3x-4)+1$	f) $\bar{3}(x-1) = f\left(\frac{y}{2}+3\right)$

7. Given the four transformations in the given order, what will function $y = f(x)$ result in?

a) 1st) $x \to -\frac{1}{2}x$ 2nd) $y \to \frac{-y}{4}$ 3rd) $x \to x+4$ 4th) $y \to y-12$

b) 1st) $x \to 2-x$ 2nd) $y \to 5-\frac{1}{2}y$ 3rd) $y \leftrightarrow x$ 4th) $y \to y+4$

8. Given the graph of $y = f(x)$, draw the graph of the following functions:



a) $y = 2f(2x)$

b) $y = f(2x-1)$

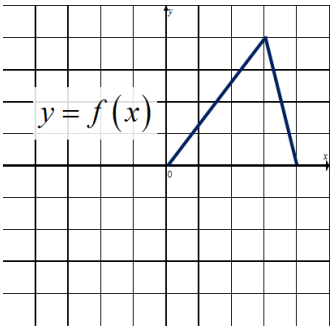
c) $y = 0.5f(x)+1$

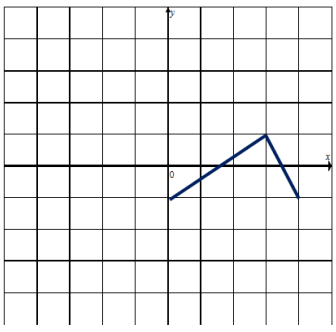
d) $x = f(2x)$

f) $y = 2f(2x-1)-1$

9. Given the graph of $y = f(x)$ on top, what is the equation of the corresponding graph below it:

a)





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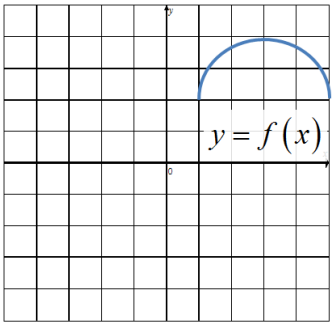

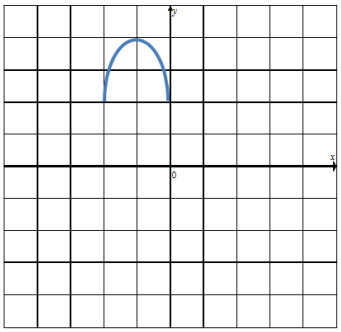

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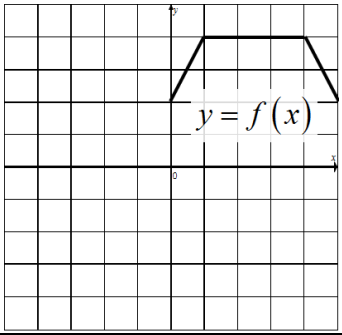
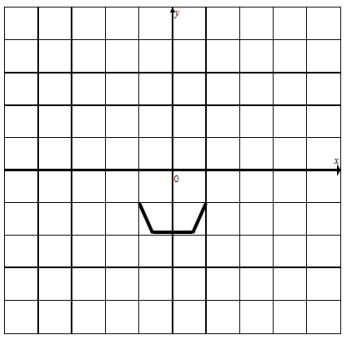




10. Point (e,f) is on the graph of $y = f(x)$, what point must be on the following functions:

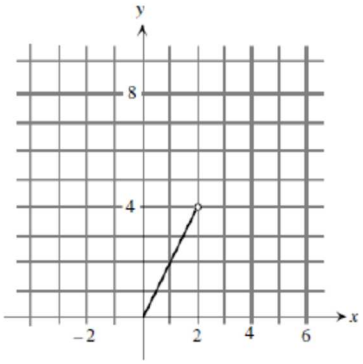
a) $y = -\frac{1}{4} f(x-3)$	b) $\frac{-3}{4} y = f(10-4x)+1$

11. Indicate the transformation required to go from the left function to the right. List the transformation in order:

a) $y = \sqrt{x} \rightarrow y = \sqrt{5-3x}$
b) $y = 3^x \rightarrow y = 4\left(3^{2x+1}\right)-6$
c) $y = \sqrt{x} \rightarrow y = 12\sqrt{-x-12}+11$
d) $y = \lvert 2x+1 \rvert \rightarrow y = 3\left\lvert \frac{4}{5}x+12 \right\rvert -1$

12. The domain and range of $y = f(x)$ is $D:\{x \geq 4\}\ \&\ R:\{y \geq 0\}$. What is the domain and range for $y = f(x+5)$?

13. Part of the graph for $y = f(x)$ is shown, $0 \leq x < 2$. If $g(x+2) = \frac{1}{2} f(x)$ for all real values of "x", draw the graph of $g(x)$ for the intervals $-2 \leq x < 0$ and $2 \leq x < 6$.



14. Challenge: if $x = \frac{1}{2}$ then the value of the product: $(1+x)(1+x^2)(1+x^4)\times.....\times(1+x^{2n-1})\times...\times(1+x^{128})$ is $2-2^k$. What is the value of "k"? CNML1994 4-6