

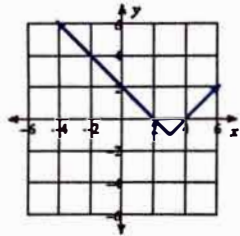
Name Key Date _____ Per _____

Unit 7 Test Review HW – Transformations of Functions & Modeling

Circle the graph that matches the given equation. Also state the transformation in words.

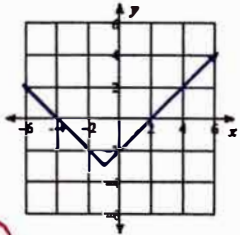
1) $y = |x + 3| + 1$

A)

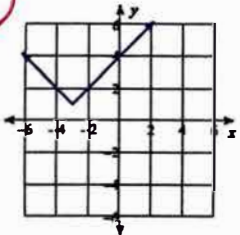


left 3
up 1

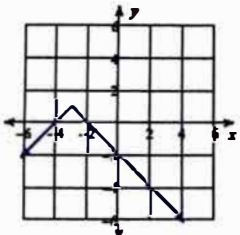
B)



C)

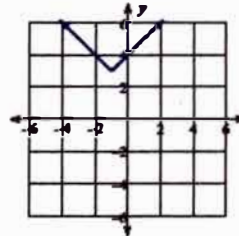


D)



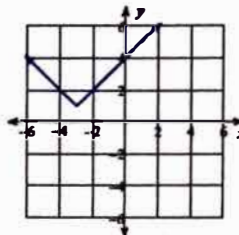
2) $y = -|x - 3| + 1$

A)

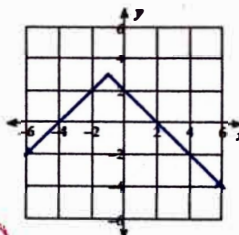


right 3
reflect x-axis
up 1

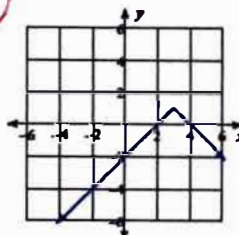
B)



C)



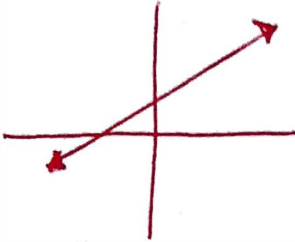
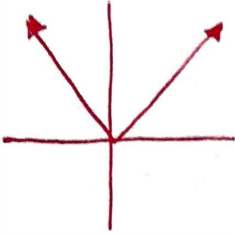
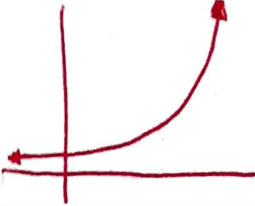
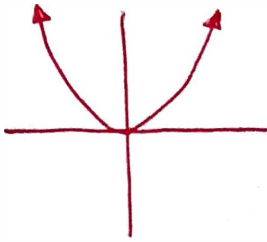
D)



For question 3-5, state the transformations in words.

<p>3. $f(x) = 3 x - 2 - 4$</p> <ul style="list-style-type: none"> - right 2 - vertical stretch by 3 - down 4 	<p>4. $h(x) = -f(x + 5) + 7$</p> <ul style="list-style-type: none"> - left 5 - reflect over x-axis - up 7 	<p>5. $g(x) = f(-x) + 3$</p> <ul style="list-style-type: none"> - reflect over y-axis - up 3
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6. Draw an example for each of the function below:

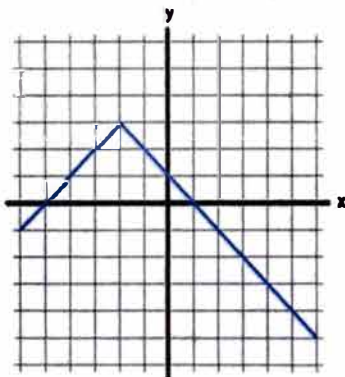
Linear	Absolute Value	Exponential	Quadratic
			

7. Describe what each number represents and/or does to the graph of the parent function in

$$f(x) = 5(4)^{x-3} + 2$$

a. 5 initial value, vertical stretch by 5	b. 4 growth factor	c. 3 horizontal shift right 3
d. 2 vertical shift up 2		

8. Use your understanding of transformations of functions to write the equation for the absolute value graph below. Also state the domain and range.



Parent Function: $f(x) = |x|$

Equation: $g(x) = -|x+2| + 3$

Domain: $(-\infty, \infty)$

Range: $(-\infty, 3]$

For question 9-12, write the equation for the function described below. All are using the same parent function $f(x) = 4^x$

9. Shift left 4 and up 2

$$g(x) = 4^{x+4} + 2$$

10. Reflect over the x-axis and shift down 7

$$g(x) = -4^x - 7$$

11. Vertically stretch by a factor of 5

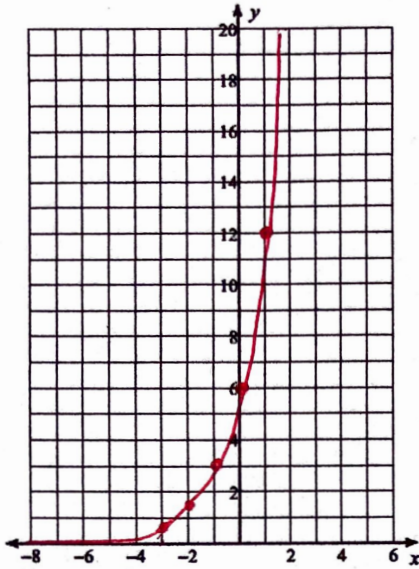
$$g(x) = 5 \cdot 4^x$$

12. Reflect over the y-axis and shift down 3

$$g(x) = 4^{-x} - 3$$

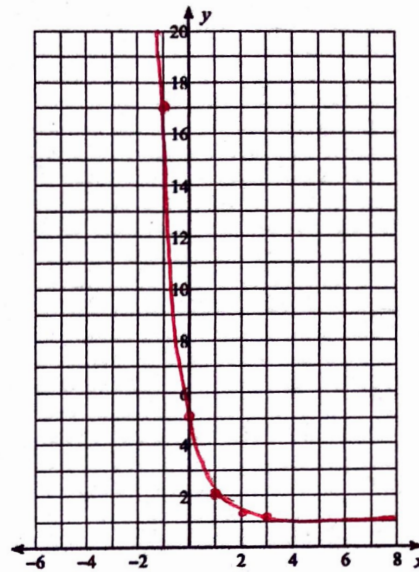
13-15) Graph each function below, describe the transformation in words.

13. $y = 3 \cdot 2^{x+1}$



x	y
-3	$3 \cdot \frac{1}{4} = \frac{3}{4}$
-2	$3 \cdot \frac{1}{2} = \frac{3}{2}$
-1	3
0	6
1	12
2	$3 \cdot 8 = 24$

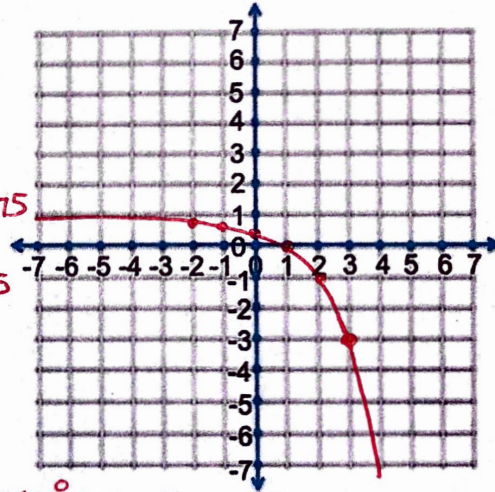
14. $y = \left(\frac{1}{4}\right)^{x-1} + 1$



x	y
-1	$\left(\frac{1}{4}\right)^{-2} + 1 = 17$
0	$\left(\frac{1}{4}\right)^{-1} + 1 = 5$
1	$1 + 1 = 2$
2	$\left(\frac{1}{4}\right)^1 + 1 = 1.25$
3	$\left(\frac{1}{4}\right)^2 + 1 = 1.0625$

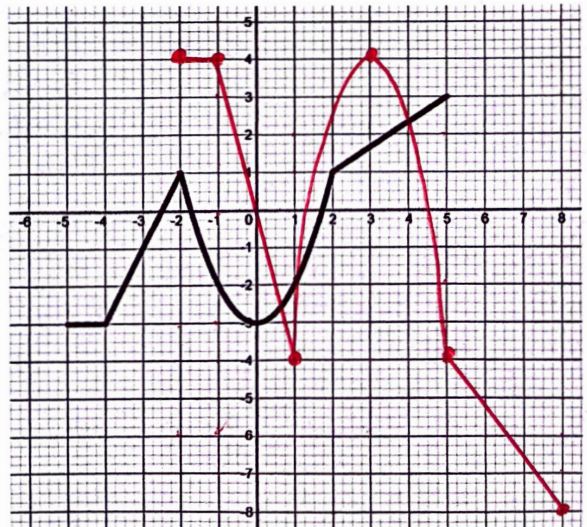
15. $f(x) = -4(2)^{x-3} + 1$

x	y
-2	$-4(2)^{-2-3} + 1 = -4(2)^{-5} + 1 = \frac{-4}{32} + 1 = 0.875$
-1	$-4(2)^{-1-3} + 1 = -4(2)^{-4} + 1 = \frac{-4}{16} + 1 = 0.75$
0	$-4(2)^{-3} + 1 = \frac{-4}{8} + 1 = 0.5$
1	$-4(2)^{-2} + 1 = \frac{-4}{4} + 1 = 0$
2	$-4(2)^{-1} + 1 = \frac{-4}{2} + 1 = -1$
3	$-4(2)^0 + 1 = -3$



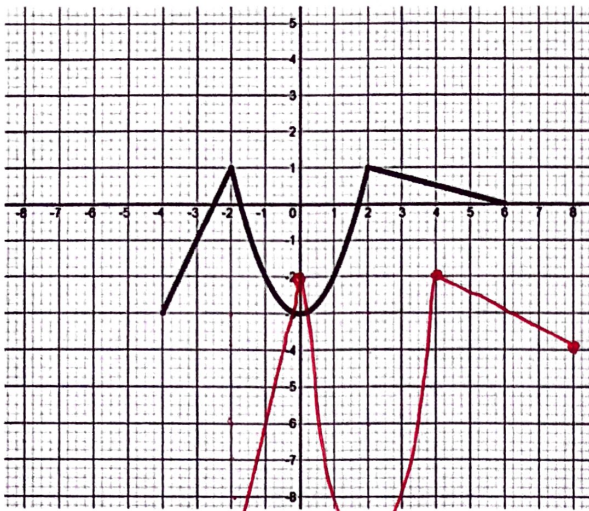
16. Given the graph of $f(x)$ below, write the equation for $g(x)$ such that it transforms $f(x)$ by: **down 2, right 3, reflect across the x-axis, and vertically stretch by 2.** Then, graph $g(x)$ on the same coordinate plane as $f(x)$.

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



Use the given graph below of $h(x)$ to graph each of the following transformations. Describe each transformation.

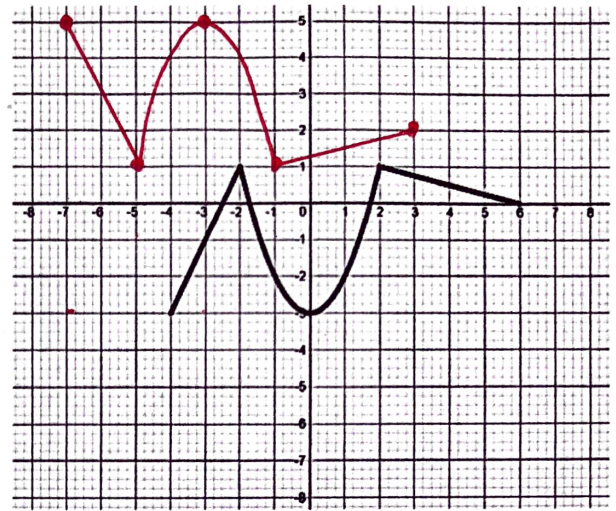
17. $y = 2h(x - 2) - 4$



Transformations:

- Shift right 2
- vertical stretch by 2
- Shift down 4

18. $y = -h(x + 3) + 2$

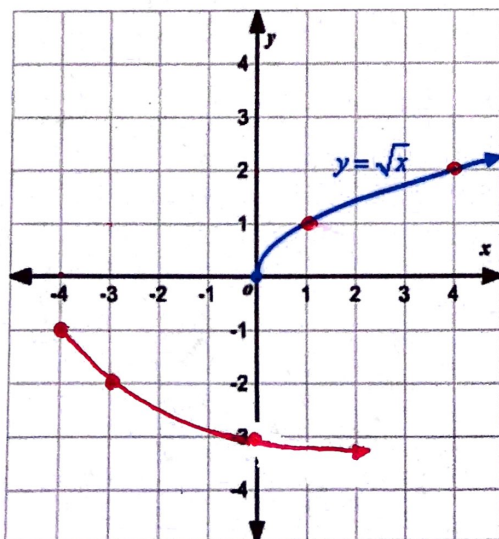


Transformations:

- shift left 3
- reflect over x-axis
- Shift up 2

Use the parent function to graph each equation below:

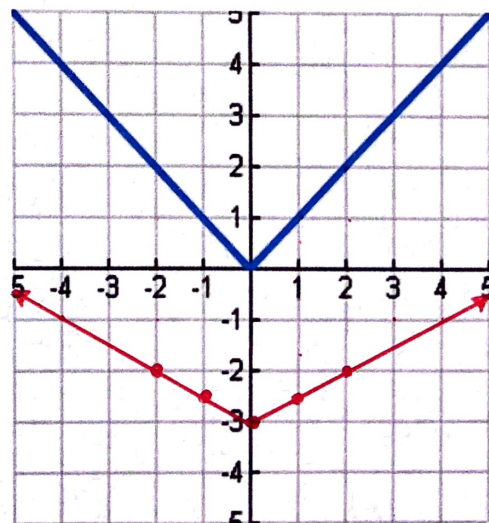
19. $f(x) = -\sqrt{x + 4} - 1$



Transformations:

- Shift left 4
- reflect over x-axis
- Shift down 1

20. $f(x) = \frac{1}{2}|x| - 3$



Transformations:

- vertical shrink by $\frac{1}{2}$
- Shift down 3

Use the graph below for problem 21-25.

21. Find $f(-1) = 2$

22. Find $f(3) = -1$

23. Is there a relative maximum or minimum on this graph? Where are they?

Max at $x = 1$ $(1, 4)$

Min at $x = 2$ $(2, -2)$

24. For what intervals is the function:

Increasing: $(-\infty, 1)$ $(2, \infty)$

decreasing: $(1, 2)$

constant: $-$

25. What is the domain and range of this function?

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

