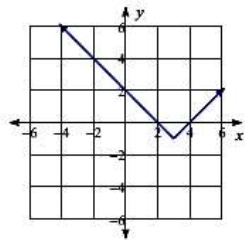


Unit 7 Test Review HW – Transformations of Functions & Modeling

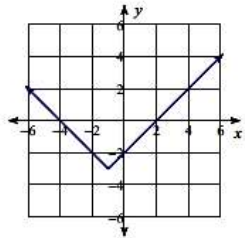
Circle the graph that matches the given equation. Also state the transformation in words.

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

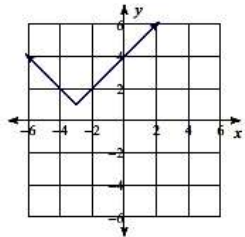
A)



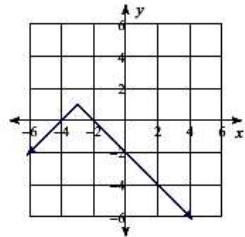
B)



C)

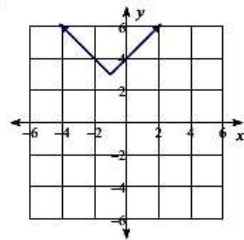


D)

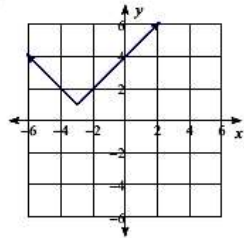


2) $y = -|x - 3| + 1$

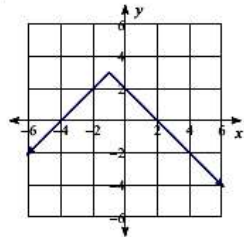
A)



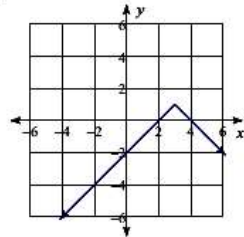
B)



C)



D)



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

<p>3. $f(x) = 3 x - 2 - 4$</p>	<p>4. $h(x) = -f(x + 5) + 7$</p>	<p>5. $g(x) = f(-x) + 3$</p>
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6. Draw an example for each of the function below:

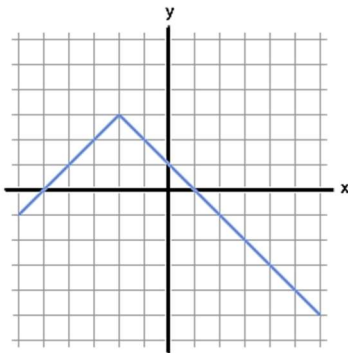
Linear	Absolute Value	Exponential	Quadratic

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	b. 4	c. 3
d. 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: _____

Domain: _____

Range: _____

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

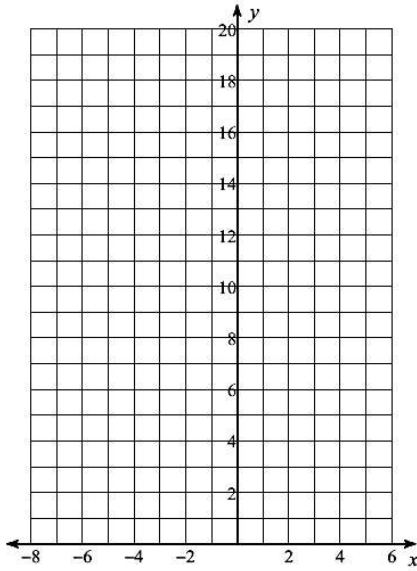
10. Reflect over the x-axis and shift down 7

11. Vertically stretch by a factor of 5

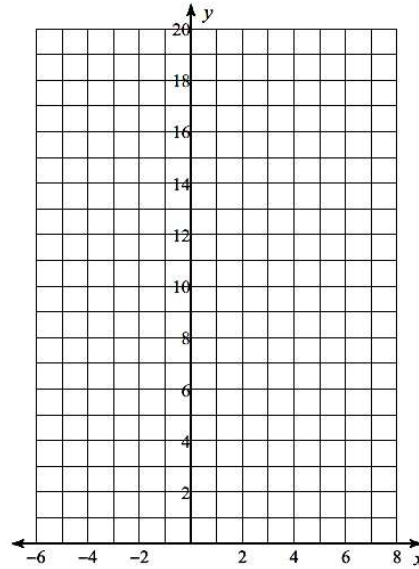
12. Reflect over the y-axis and shift down 3

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

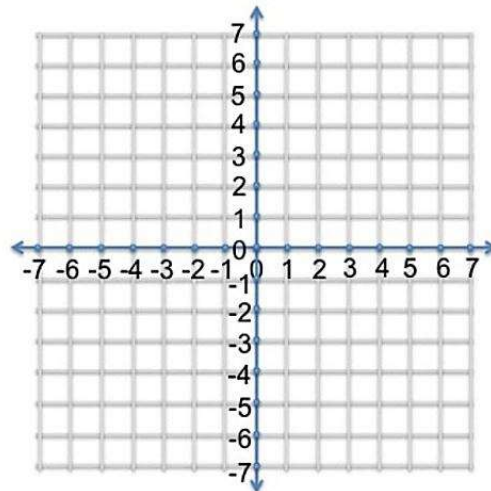
13. $y = 3 \cdot 2^{x+1}$



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

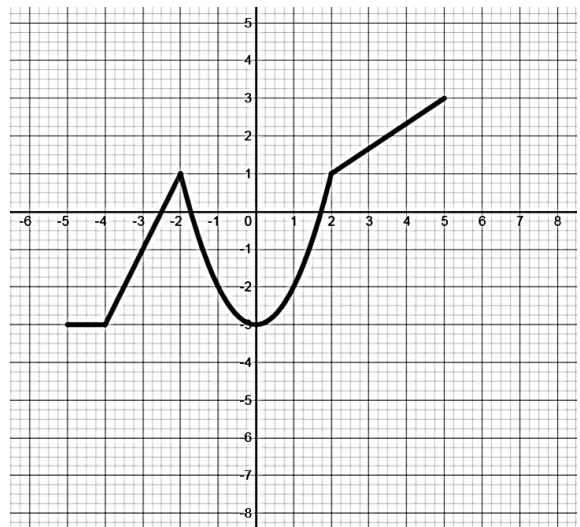


15. $f(x) = -4(2)^{x-3} + 1$



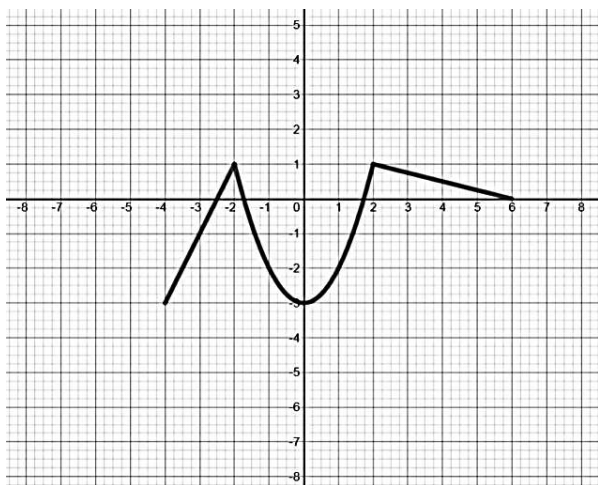
16. Given the graph of $f(x)$ below, write the equation for $g(x)$ such that it **transforms $f(x)$ by: down 2, right 3, reflect across the x -axis, and vertically stretch by 2.** Then, graph $g(x)$ on the same coordinate plane as $f(x)$.

$g(x) =$ _____



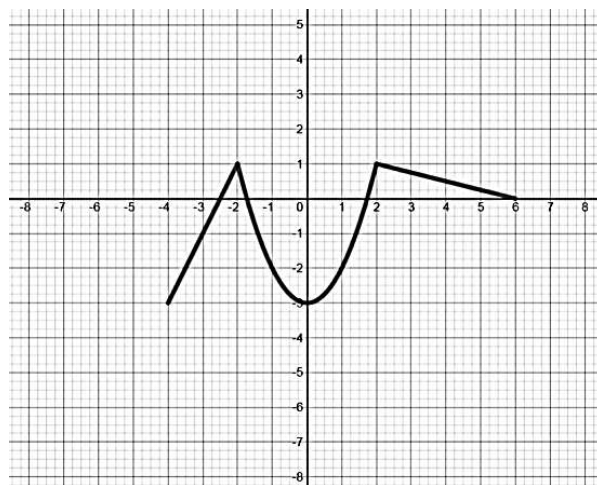
Use the given graph below of $h(x)$ to graph each of the following transformations. Describe each transformation.

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



Transformations:

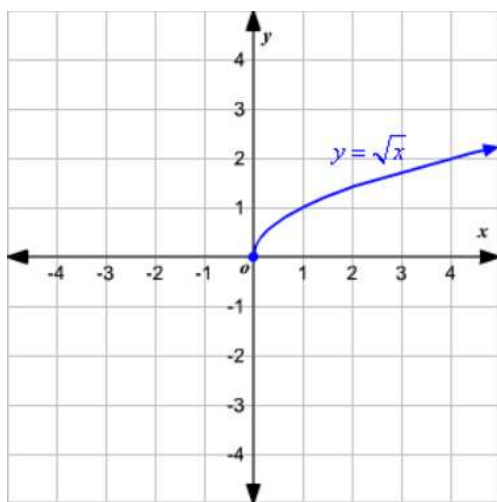
18. $y = -h(x + 3) + 2$



Transformations:

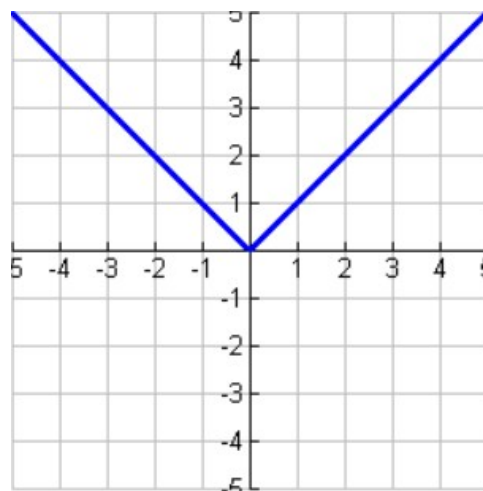
Use the parent function to graph each equation below:

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



Transformations:

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



Transformations:

Use the graph below for problem 21-25.

21. Find $f(-1)$

22. Find $f(3)$

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

24. For what intervals is the function:

Increasing: _____

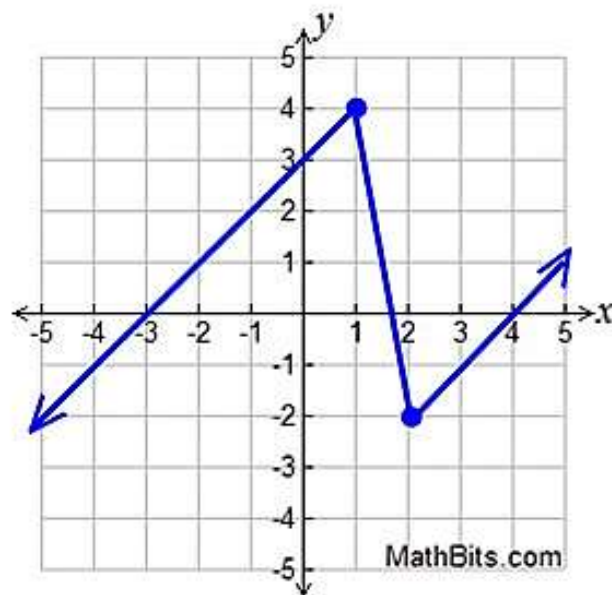
Decreasing: _____

Constant: _____

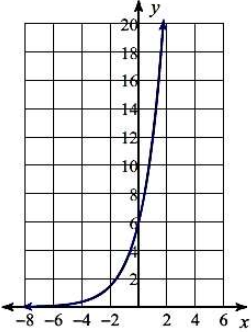
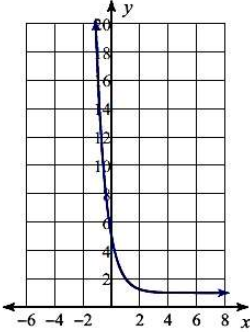
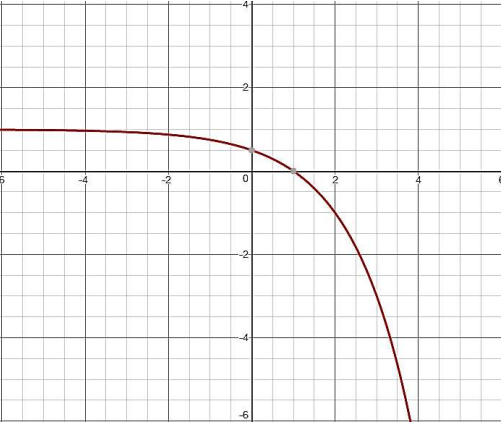
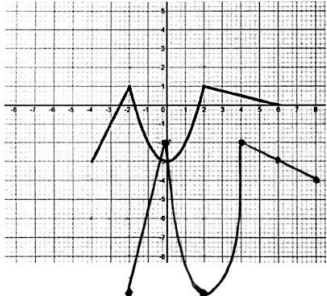
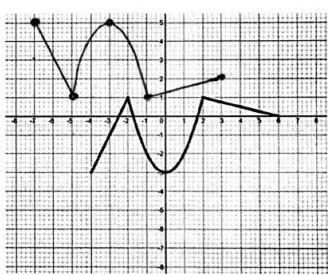
25. What is the domain and range of this function?

Domain: _____

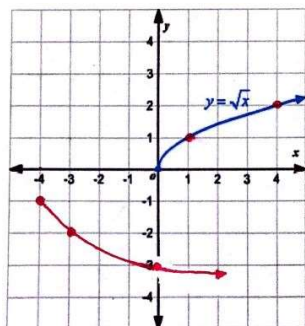
Range: _____



Answer Key

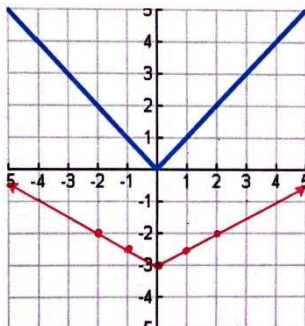
<p>1. C, horizontal shift left 3, vertical shift up 1</p>	<p>2. D, horizontal shift right 3, vertical shift up 1, reflected across x-axis</p>	<p>3. vertical stretch by 3, horizontal shift right 2, vertical shift down 4</p>
<p>4. Horizontal shift left 5, reflect across x-axis, vertical shift up 7</p>	<p>5. Reflect over y-axis, Vertical shift up 3</p>	<p>6. See pictures</p>
<p>7. a) Initial value, stretches vertically by a factor of 5 b) Growth factor c) Horizontal shift right 3 d) vertical shift up 2</p>	<p>8. $g(x) = - x + 2 + 3$ Domain: $(-\infty, \infty)$ Range: $(-\infty, 3]$</p>	<p>9. $g(x) = 4^{x+4} + 2$</p>
<p>10. $g(x) = -4^x - 7$</p>	<p>11. $g(x) = 5 \cdot 4^x$</p>	<p>12. $g(x) = 4^{-x} - 3$</p>
<p>13.</p>  <p>Vertical stretch by 3 Shift left 1</p>	<p>14.</p>  <p>Shift right 1 Shift up 1</p>	<p>15.</p>  <p>Reflect across x-axis Vertical stretch by 4, shift right 3, up 1</p>
<p>16. $g(x) = -2f(x-3) - 2$</p>	<p>17.</p> 	<p>18.</p> 

19.



Shift left 4
Reflect over x-axis
Shift down 1

20.



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

21. $f(-1)=2$

22. $f(3) = -1$

23. Relative max at $x = 1$ (1, 4)
Relative min at $x = 2$ (2, -2)

24. Increasing: $(-\infty, 1)$ and $(2, \infty)$
Decreasing: $(1, 2)$
Constant: none
25. Domain: $(-\infty, \infty)$
Range: $(-\infty, \infty)$