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## **Unit 1 Review**

## **Multiple Choice**

Identify the choice that best completes the statement or answers the question.

- 1. The function y = f(x) is transformed to y = f(3x 6). Identify the horizontal expansion or compression factor, then the translation to the graph of the function.
  - c. horizontal expansion by a factor of 3, horizontal expansion by a factor of 3, a. then a translation of 6 units right. then a translation of 2 units right.
  - horizontal compression by a factor of  $\frac{1}{3}$ , d. horizontal compression by a factor of  $\frac{1}{3}$ , b. then a translation of 6 units right. then a translation of 2 units right.

2. If (6,-5) is a point on the graph of y = f(x), what must be a point on the graph of y = -f(2(x+2)) - 3?

- a. (-1,2)c. (1,2)d. (10,2) b. (1,-2)
- 3. If (4,-3) is a point on the graph of y = f(x), what mus be a point on the graph of y = f(2x + 10)?
  - c. (3,-3)d. (18,-3)a. (-8, -3)b. (-3, -3)

4. If (a,b) is a point on the graph of y = f(x), determine a point on the graph of y = f(x+5) - 1. c. (a-5,b-1)d. (a-5,b+1)a. (a+5,b-1)b. (a+5,b+1)

- 5. How is the graph of  $y = \sqrt{x+2} 5$  related to the graph of  $y = \sqrt{x}$ ?
  - a.  $y = \sqrt{x}$  has been translated 2 units right c.  $y = \sqrt{x}$  has been translated 2 units left and 5 units up. and 5 units up.
  - b.  $y = \sqrt{x}$  has been translated 2 units right d.  $y = \sqrt{x}$  has been translated 2 units left and 5 units down.
    - and 5 units down.

6. Given 
$$f(x) = \frac{1}{3}x - 7$$
, determine  $y = f^{-1}(x)$ , the inverse of  $f(x)$ .  
a.  $f^{-1}(x) = 3x + 7$   
b.  $f^{-1}(x) = 3x + 21$   
c.  $f^{-1}(x) = 3x - 7$   
d.  $f^{-1}(x) = 3x - 21$ 

7. Which equation represents the graph of y = f(x) after it is compressed horizontally by a factor of  $\frac{1}{3}$  and then translated 2 units left?

a. 
$$y = f(3x+6)$$
  
b.  $y = f(3x+2)$   
c.  $y = f\left(\frac{x+2}{3}\right)$   
d.  $y = f\left(\frac{x}{3}+2\right)$ 

8. If the graph of the function  $y = \sqrt{x}$  is horizontally expanded by a factor of 4 and then translated 3 units to the right, determine the equation of this new function.

a. 
$$y = \sqrt{4(x-3)}$$
  
b.  $y = \sqrt{\frac{1}{4}(x-3)}$   
c.  $y = \sqrt{4x-3}$   
d.  $y = \sqrt{\frac{1}{4}x-3}$ 

9. If (4,-5) is a point on the graph of y = f(x), what must be a point on the graph of y = -f(2x) + 3?



The graph of y = f(x) is shown above on the left. Which equation represents the graph shown on the right?

a.	$y = f\left(-(x+8)\right)$	c.	y = -f(x-8)
b.	$y = f\left(-(x-8)\right)$	d.	y = -f(x+8)

11. The point (6,-12) is on the graph of the function y = f(x). Which point must be on the graph of the function 4y = f(-x)?

a. 
$$(-6, -48)$$
 c.  $(-6, -3)$ 

b. (6,3) d. (6,48)

12. The function y = f(x) is graphed to the left below. Determine the equation of the function shown to the right.



- 13. The point (9,-12) is on the graph of a function. What will the coordinates of this point be after all of the following transformations are performed on the function, in the order given?
  - horizontal expansion by a factor of 3
  - reflection in the x-axis
  - vertical translation of 5 downward
  - refelction in the line y = x

a. 
$$(-27,7)$$
c.  $(7,3)$ b.  $(-17,-27)$ d.  $(7,27)$ 

14. What is the inverse of the relation  $y = x^2$ 

a. 
$$y = \frac{1}{x^2}$$
  
b.  $y = (-x)^2$   
c.  $x = y^2$   
d.  $y = x^{\frac{1}{2}}$ 

15. If f(x) = 2x + 3, determine the equation of  $f^{-1}(x)$ , the inverse of f(x).

a. 
$$f^{-1}(x) = \frac{1}{2x+3}$$
  
b.  $f^{-1}(x) = \frac{1}{2}x+3$   
c.  $f^{-1}(x) = \frac{x-3}{2}$   
d.  $f^{-1}(x) = \frac{x+3}{2}$ 

## Short Answer



The graph of y = f(x) is shown. Sketch the graph of y = 3f(x-2)



The graph of y = f(x) is shown above. Draw the graph that represents y = |f(x)| + 2.



18. If the point (6, 10) is on the graph of y = f(x), what point must be on the graph of  $y = \frac{1}{2f(x)}$ ?

- 20. If the point (2, -8) is on the graph of y = f(x 3) + 4, what point must be on the graph of y = f(x)?
- 21. If the maximum value of the function y = f(x) is 9, determine the maximum value of  $y = \frac{1}{3}f\left(\frac{1}{2}x\right)$ .
- 22. If  $f(x) = \frac{3x}{x+1}$ , determine the equation of  $f^{-1}(x)$ , the inverse of f(x).

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## Problem



23. The graph of y = f(x) is shown below.

Sketch the graph of y = 2f(x) - 3

24. The graph of y = f(x) is shown below.



Sketch the inverse relation of y = f(x).