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## Unit 1 Review

## Multiple Choice

Identify the choice that best completes the statement or answers the question.
$\qquad$ 1. The function $y=f(x)$ is transformed to $y=f(3 x-6)$. Identify the horizontal expansion or compression factor, then the translation to the graph of the function.
a. horizontal expansion by a factor of 3, then a translation of 6 units right.
c. horizontal expansion by a factor of 3, then a translation of 2 units right.
b. horizontal compression by a factor of $\frac{1}{3}$, then a translation of 6 units right.
d. horizontal compression by a factor of $\frac{1}{3}$, 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. $(-1,2)$
b. $(1,-2)$
c. $(1,2)$
d. $(10,2)$
3. If $(4,-3)$ is a point on the graph of $y=f(x)$, what mus be a point on the graph of $y=f(2 x+10)$ ?
a. $(-8,-3)$
b. $(-3,-3)$
c. $(3,-3)$
d. $(18,-3)$
4. If $(a, b)$ is a point on the graph of $y=f(x)$, determine a point on the graph of $y=f(x+5)-1$.
a. $(a+5, b-1)$
b. $(a+5, b+1)$
c. $(a-5, b-1)$
d. $(a-5, b+1)$
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 and 5 units up.
c. $y=\sqrt{x}$ has been translated 2 units left and 5 units up.
b. $y=\sqrt{x}$ has been translated 2 units right and 5 units down.
d. $y=\sqrt{x}$ has been translated 2 units left and 5 units down.
$\qquad$ 6. Given $f(x)=\frac{1}{3} x-7$, determine $y=f^{-1}(x)$, the inverse of $f(x)$.
a. $\quad f^{-1}(x)=3 x+7$
b. $f^{-1}(x)=3 x+21$
c. $f^{-1}(x)=3 x-7$
d. $f^{-1}(x)=3 x-21$
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. $\quad y=f(3 x+6)$
b. $\quad y=f(3 x+2)$
c. $\quad y=f\left(\frac{x+2}{3}\right)$
d. $\quad y=f\left(\frac{x}{3}+2\right)$
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. $y=\sqrt{4 x-3}$
d. $y=\sqrt{\frac{1}{4} x-3}$
$\qquad$ 9. If $(4,-5)$ is a point on the graph of $y=f(x)$, what must be a point on the graph of $y=-f(2 x)+3$ ?
a. $(-8,-2)$
b. $(-2,-2)$
c. $(2,8)$
d. $(8,8)$
10.


The graph of $y=f(x)$ is shown above on the left. Which equation represents the graph shown on the right?
a. $\quad y=f(-(x+8))$
b. $\quad y=f(-(x-8))$
c. $y=-f(x-8)$
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 $4 y=f(-x)$ ?
a. $(-6,-48)$
b. $(6,3)$
c. $(-6,-3)$
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.

a. $\quad y=f(2(x-1))$
b. $\quad y=f\left(\frac{1}{2}(x-1)\right)$
c. $y=2 f(x-1)$
d. $\quad y=\frac{1}{2} f(x-1)$
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 $\mathrm{y}=\mathrm{x}$
a. $(-27,7)$
b. $(-17,-27)$
c. $(7,3)$
d. $(7,27)$

14. What is the inverse of the relation $y=x^{2}$
a. $\quad y=\frac{1}{x^{2}}$
b. $\quad y=(-x)^{2}$
c. $x=y^{2}$
d. $y=x^{\frac{1}{2}}$
15. If $f(x)=2 x+3$, determine the equation of $f^{-1}(x)$, the inverse of $f(x)$.
a. $\quad f^{-1}(x)=\frac{1}{2 x+3}$
b. $\quad f^{-1}(x)=\frac{1}{2} x+3$
c. $\quad f^{-1}(x)=\frac{x-3}{2}$
d. $\quad f^{-1}(x)=\frac{x+3}{2}$

## Short Answer


16.

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


The graph of $y=f(x)$ is shown above. Draw the graph that reprents $y=|f(x)|+2$.
18. If the point $(6,10)$ is on the graph of $y=f(x)$, what point must be on the graph of $y=\frac{1}{2 f(x)}$ ?
19.


Given the graph of $\mathrm{y}=\mathrm{f}(\mathrm{x})$ on the right, determine the equation of the function on the left.
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 $f(x)=\frac{3 x}{x+1}$, determine the equation of $f^{-1}(x)$, the inverse of $f(x)$.

## Problem

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


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


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

