

Chapter 1 Test

Multiple Choice

For #1 to #6, choose the best answer.

1. The graph $y = f(x)$ contains the point (3, 4). After a transformation, the point (3, 4) is transformed to (5, 5). Which of the following is a possible equation of the transformed function?

A $y + 1 = f(x + 2)$
 B $y + 1 = f(x - 2)$
 C $y - 1 = f(x + 2)$
 D $y - 1 = f(x - 2)$

2. The graph of $y = |x|$ is transformed by a vertical stretch by a factor of 3 about the x -axis, and then a horizontal translation of 3 units left and a vertical translation up 1 unit. Which of the following points is on the transformed function?

A (0, 0)
 B (1, 3)
 C (-3, 1)
 D (3, 1)

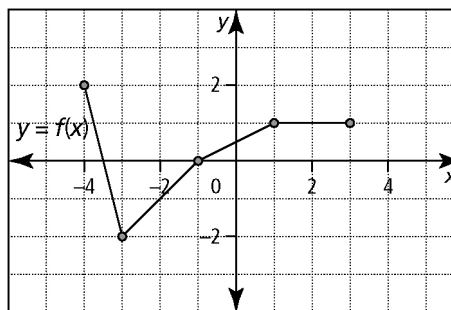
3. The graph of $y = \sqrt{x}$ is vertically stretched by a factor of 2 about the x -axis, then reflected about the y -axis, and then horizontally translated left 3. What is the equation of the transformed function?

A $y = 2\sqrt{-x - 3}$
 B $y = 2\sqrt{-x + 3}$
 C $y = -2\sqrt{x + 3}$
 D $y = -2\sqrt{x - 3}$

4. Which of the following transformations would produce a graph with the same x -intercepts as $y = f(x)$?

A $y = -f(x)$
 B $y = f(-x)$
 C $y = f(x + 1)$
 D $y = f(x) + 1$

5. Given the graph of $y = f(x)$, what is the invariant point under the transformation $y = f(-2x)$?



A (-1, 0) B $(0, \frac{1}{2})$
 C (1, 1) D (3, 1)

6. What will the transformation of the graph of $y = f(x)$ be if y is replaced with $-y$ in the equation $y = f(x)$?

A It will be reflected in the x -axis.
 B It will be reflected in the y -axis.
 C It will be reflected in the line $y = x$.
 D It will be reflected in the line $y = -1$.

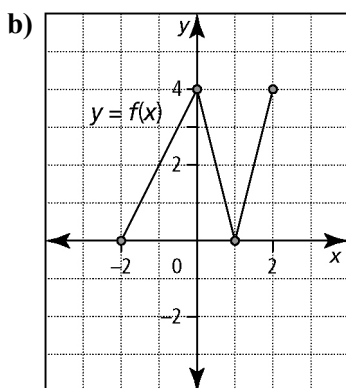
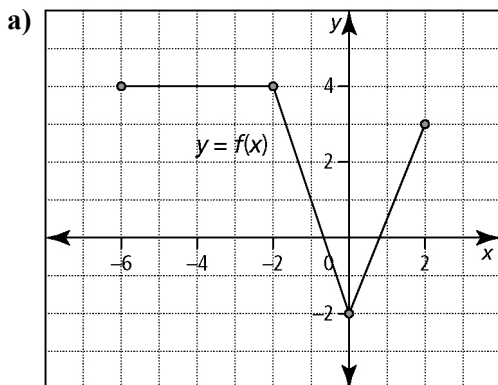
Short Answer

7. If the range of function $y = f(x)$ is $\{y \mid y \geq 4\}$, state the range of the new function $g(x) = f(x + 2) - 3$.
8. As a result of the transformation of the graph of $y = f(x)$ into the graph of $y = -3f(x + 2) - 5$, the point (2, 5) becomes point (x, y). Determine the value of (x, y).
9. The graph of $f(x)$ is stretched horizontally by a factor of $\frac{1}{2}$ about the y -axis and then stretched vertically by a factor of $\frac{1}{3}$ about the x -axis. Determine the equation of the transformed function.
10. A function $f(x) = x^2 - x - 2$ is multiplied by a constant value k to create a new function $g(x) = kf(x)$. If the graph of $y = g(x)$ passes through the point (3, 14), state the value of k .

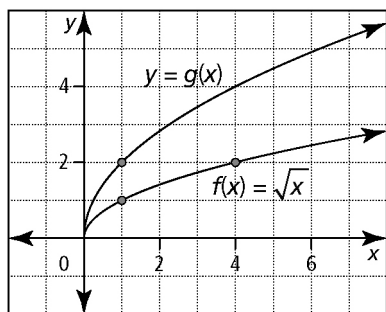


Extended Response

11. Copy the graph of each relation. Then, sketch the graph of the inverse relation.

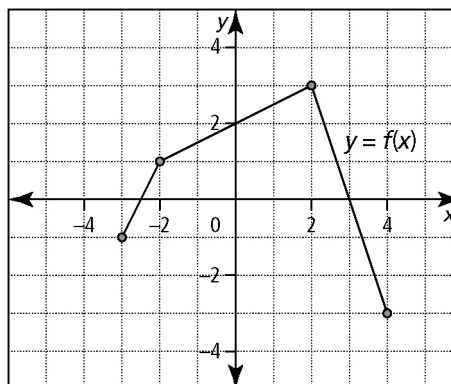


12. The graphs of $y = f(x)$ and $y = g(x)$ are shown.



- a) If the point $(1, 1)$ on $y = f(x)$ maps onto the point $(1, 2)$ on $y = g(x)$, describe the transformation and state the equation of $g(x)$.
- b) If the point $(4, 2)$ on $y = f(x)$ maps onto the point $(1, 2)$ on $y = g(x)$, describe the transformation and state the equation of $g(x)$.

13. Consider the graph of the function $y = f(x)$.



- a) Describe the transformation of $y = f(x)$ to $y = 3f(-2(x - 1)) + 4$.
- b) Sketch the graph.
14. A function is defined by $f(x) = (x + 2)(x - 3)$.
- a) If $g(x) = kf(x)$, describe how k affects the y -intercept of the graph of the function $y = g(x)$ compared to $y = f(x)$.
- b) If $h(x) = f(mx)$, describe how m affects the x -intercepts of the graph of the function $y = h(x)$ compared to $y = f(x)$.
15. Complete the following for the quadratic function $f(x) = x^2 - 2x + 1$.
- a) Write the equation of $f(x)$ in the form $y = a(x - h)^2 + k$.
- b) Determine the coordinates of the vertex of $x = f(y)$.
- c) State the equation of the inverse.
- d) Restrict the domain of $y = f(x)$ so that its inverse is a function.

