

Unit 6: Transformations of Functions

ADVANCED

Name: _____ Date: _____

Show all work. Write each answer as a number, fraction, coordinate pair, or short value exactly as asked.

1. The graph of $f(x) = x^2$ is transformed to $g(x) = -3(x + 4)^2 - 7$. The vertex of f is at the origin $(0, 0)$. What are the coordinates of the vertex of g ? Give your answer as (h, k) .

Answer: _____

2. Let $f(x) = 2x^3 - 5x$. Its graph is shifted right 3 units, then reflected across the x -axis to form $g(x)$. Compute $g(5)$.

Answer: _____

3. A function is even, odd, or neither. Determine the type for $h(x) = x^4 - 3x^2 + 6$. Answer with exactly one word: even, odd, or neither.

Answer: _____

4. Determine whether $f(x) = 5x^3 - 2x$ is even, odd, or neither. Answer with exactly one word: even, odd, or neither.

Answer: _____

5. The point $(6, -8)$ lies on the graph of $y = f(x)$. The function is transformed to $y = f(2x + 4) - 3$. Find the coordinates of the corresponding point on the new graph. (Hint: solve $2x + 4 = 6$ for the new x -value.) Give your answer as (x, y) .

Answer: _____

6. Starting from $f(x) = \sqrt{x}$, apply in order: horizontal compression by factor $1/2$ (i.e., replace x with $2x$), then shift up 5. The result is $g(x)$. Compute $g(8)$.

Answer: _____

7. The point $(-4, 10)$ is on the graph of an ODD function f . What are the coordinates of another point that must also be on the graph of f ? Give your answer as (x, y) .

Answer: _____

8. A transformation maps $y = f(x)$ to $y = 2 \cdot f(x/3) + 1$. The point $(9, -4)$ is on the graph of f . Find the image point on the transformed graph. Give your answer as (x, y) .

Answer: _____

9. Function g is obtained from $f(x) = |x|$ by the rule $g(x) = (1/2)|x - 6| + 4$. The vertex of f is at $(0, 0)$. Find the value of g at $x = 6$, i.e., compute $g(6)$.

Answer: _____

10. The graph of $f(x) = x^2$ is scaled to $g(x) = a \cdot x^2$ so that the point $(2, 20)$ lies on g . Then g is reflected across the x -axis to form $h(x)$. Find $h(3)$.

Answer: _____