

1. If the point $(-3, 7)$ is on the graph of an equation, what other point(s) must be on the graph if the graph is symmetric about . . .
 - a. the x -axis.
 - b. the y -axis.
 - c. the origin.
 - d. both the x - and y -axis.

2. The graph of a function f contains the point $(2, -5)$.
 - a. The graph of a function g is obtained by shifting the graph of f 3 units to the right, then 2 units upward, then reflecting in the y -axis. Find a point on the graph of g .
 - b. The graph of a function h is obtained by shifting the graph of f 4 units to the left, then 6 units downward, then reflecting in the x -axis. Find a point on the graph of h .

3. Find the function g that is finally graphed after the following three transformations are applied to the graph of $f(x) = |x|$.
 - Shift left 3 units.
 - Shift up 5 units.
 - Reflect about the y -axis.

4. Consider the graph of $f(x) = x^2$. Explain why compressing the graph of f horizontally toward the y -axis by a factor of 3 gives the same result as stretching the graph vertically away from the x -axis by a factor of 9.

5. Let $f(x) = 3x^2 + 4x$. In each case, a function g is given whose graph can be obtained from the graph of f by performing a single transformation (that is, a shift left, right, up or down, a reflection in either the x -axis or y -axis, a stretch or compression by some factor away from or toward either the x -axis or y -axis). Describe the transformation that will transform the graph of f into the graph of g .
 - a. $g(x) = 3x^2 - 4x$
 - b. $g(x) = 3x^2 + 4x - 2$
 - c. $g(x) = 6x^2 + 8x$
 - d. $g(x) = 27x^2 + 12x$
 - e. $g(x) = \frac{3}{4}x^2 + 2x$
 - f. $g(x) = -3x^2 - 4x$
 - g. $g(x) = 3(x - 1)^2 + 4(x - 1)$