TRANSFORMATIONS OF QUADRATIC FUNCTIONS – Day 4

The transformation form of a quadratic function $f(x) = a(x - c)^2 + d$ is also said to be written in <u>vertex form</u>. This means that:

The vertex of the parabola is (c, d).
The line $x = c$ is the axis of symmetry of the parabola.
The maximum or minimum value of the function is d.

If $f(x) = x^2$, write the equation of the new function, g(x), under each of the following transformations.

1) Shift f(x) right 4 units g(x) = _____ Which function is equivalent to g(x)? A. $h(x) = x^2 + 4$ B. $h(x) = x^2 - 16$ C. $h(x) = x^2 - 8x + 16$ D. $h(x) = x^2 + 8x + 16$	2) Shift the vertex of f(x) to (5, -3) g(x) = _____ Which function is equivalent to g(x)? A. $h(x) = x^2 + 22$ B. $h(x) = x^2 - 10x + 22$ C. $h(x) = x^2 - 10x + 25$ D. $h(x) = x^2 - 10x - 25$
3) Reflect f(x) across the x-axis, shift up 2 units, and left 6 units g(x) = _____ Which function is equivalent to g(x)? A. $h(x) = -x^2 - 34$ B. $h(x) = -x^2 - 12x - 34$ C. $h(x) = x^2 - 12x + 36$ D. $h(x) = x^2 + 12x + 38$	4) Translate the axis of symmetry right 7 units and stretch f(x) by a factor 2. g(x) = _____ Which function is equivalent to g(x)? A. $h(x) = 2x^2 - 28x + 98$ B. $h(x) = x^2 - 14x + 49$ C. $h(x) = 2x^2 + 49$ D. $h(x) = 4x^2 - 28$

For each of the following, determine the vertex, the axis of symmetry, the maximum or minimum value, and the domain and range.

5) $y = 6(x - 5)^2 - 1$

Vertex:_____

Axis of symmetry: _____

6) $y = -3(x - 1)^2 + 4$

Max or min value: _____

D: _____ R: _____

7) $y = (x + 4)^2$

Vertex:_____

Axis of symmetry: _____

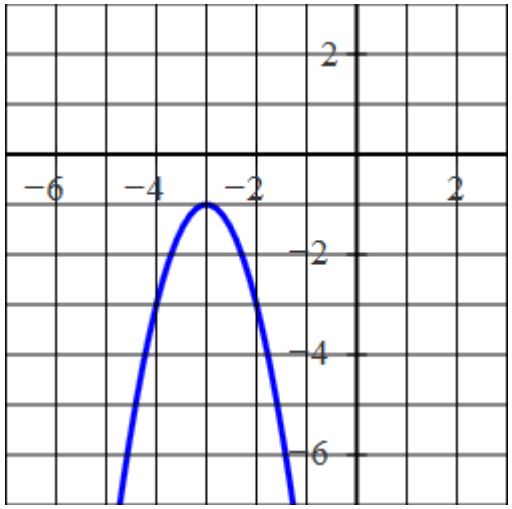
8) $y = x^2$

Max or min value: _____

D: _____ R: _____

Using the given information, answer the following.

9)



Vertex:_____

Which of the following is the equation of the given graph?

A. $h(x) = -3(x + 3)^2 - 1$
B. $h(x) = -3(x - 3)^2 - 1$
C. $h(x) = -2(x + 3)^2 - 1$
D. $h(x) = -2(x - 3)^2 - 1$

10) Which of the following graphs is a parabola with vertex (-10, 0) that passes through (1, 60.5)?

A. $h(x) = 2(x + 10)^2$
B. $h(x) = \frac{1}{2}(x + 10)^2$
C. $h(x) = (x + 1)^2 + 60.5$
D. $h(x) = \frac{1}{2}(x - 10)^2 - 60.5$