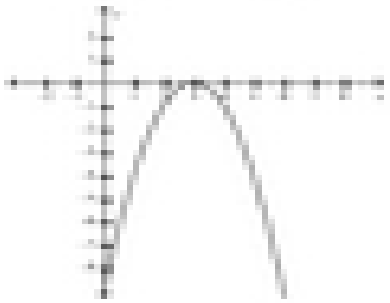
Worksheet: Transformations of Quadratic Functions

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Which correctly identifies the values of the parameters a, h, and k for the function $f(x) = -3(x+1)^2 + 5$?
a. $a = -3, h = 1, k = 5$
b. $a = 3, h = -1, k = 5$
c. $a = -3, h = -1, k = 5$
d. $a = -3, h = -1, k = -5$

____ 2. What is the equation of this graph?



a. $y = -x^2 + 1$
b. $y = -4x^2$
c. $y = -4(x-2)^2$
d. $y = 2(x-2)^2$

____ 3. Which function includes a translation of 3 units to the left?
a. $f(x) = \frac{1}{2}(x+3)^2 + 1$
b. $f(x) = -4x^2 + 1$
c. $f(x) = \frac{1}{4}(x+3)^2 + 1$
d. $f(x) = (2x+3)^2 + 1$

____ 4. Which equation shows a translation of 1 left and a vertical compression by a factor of 2 to the graph of $y = x^2$?
a. $y = 2(x-1)^2$
b. $y = 2(x+1)^2$
c. $y = \frac{1}{2}(x-1)^2$
d. $y = \frac{1}{2}(x+1)^2$

____ 5. Joanne hit a ball straight up into the air. The height of the ball in metres, is given by the function $h(t) = -5(t-1)^2 + 45$, t seconds after the ball is hit. In how many seconds will the ball hit the ground?
a. 3
b. 8
c. 9
d. 40

____ 6. Kevin threw a ball straight up with an initial speed of 20 metres per second. The function $h = -5(t-2)^2 + 25$ describes the ball's height, h metres, t seconds after Kevin threw it. What are the coordinates of the vertex?
a. $(-2, 25)$
b. $(2, 25)$
c. $(-5, 2)$
d. $(5, 20)$

____ 7. Which equation describes a parabola that opens downward, is congruent to $y = x^2$, and has its vertex at $(4, 3)$?