Name: _____ Date: _____

BLM 5–4

Section 5.2 Change Quadratic Relations From Vertex Form to Standard Form

1. Write each relation in standard form.
a) $y = (x - 3)^2$ **b)** $y = (x + 2)^2$
c) $y = (x + 6)^2$ **d)** $y = (x - 5)^2$

2. Write each relation in standard form.
a) $y = 2(x + 3)^2$
b) $y = -3(x - 5)^2$
c) $y = 0.5(x + 4)^2$
d) $y = -0.75(x - 4)^2$

3. Write each relation in standard form.
a) $y = (x + 3)^2 - 1$
b) $y = (x - 2)^2 + 5$
c) $y = (x + 1)^2 - 4$
d) $y = (x - 0.5)^2 + 2$

4. Write each relation in standard form.
a) $y = 3(x - 2)^2 + 1$
b) $y = 0.25(x + 4)^2 + 4$
c) $y = -2(x - 1)^2 + 4$
d) $y = -0.5(x + 6)^2 + 3$

5. Write an equation in standard form for each quadratic relation.
a) $a = -3$, vertex at (4, 3)
b) $a = 2$, minimum of 5 at $x = -1$
c) $a = -0.5$, maximum of 3 at $x = 2$
d) $a = 5$, minimum of 4 at $x = -3$

6. Find the y-intercept of each relation.
a) $y = 6x^2 + 4x + 1$
b) $y = -3(x + 1)^2 + 5$
c) $y = 0.5(x - 4)^2 + 6$
d) $y = 6x^2 + 36$

7. A baseball was hit into the air. Its path can be modelled by the relation $h = -2(d - 4)^2 + 33$ where d is the horizontal distance and h is the height, both in metres.
a) Write the relation that models the path of the baseball in standard form.
b) What was the vertex of the relation?
c) What was the maximum height reached by the baseball?
d) What was the horizontal distance travelled when the baseball reached its maximum height?

8. The path of a toy rocket can be modelled by the relation $h = -0.38x^2 + bx + c$, where x is the horizontal distance and h is the height, both in metres. The rocket reached its maximum height of 40 m at a horizontal distance of 10 m.
a) Write the relation that models the path of the rocket in vertex form.
b) Write this relation in standard form.
c) What was the initial height of the toy rocket?
d) What was the maximum height reached by the toy rocket?

9. An arrow was shot from a cliff, h metres above the canyon floor. After 5 s, the arrow reached a maximum height of 183 m. The path of the arrow can be modelled by the relation $h = -4.9t^2 + vt + h_0$, where t is the time in seconds. Find the initial velocity, v, in metres per second and the initial height, h_0, in metres, of the arrow.

