Name _____

2-1 Additional Practice

Vertex Form of a Quadratic Function

Graph each function. Describe how it was translated from $f(x) = x^2$.

1. $f(x) = x^2 + 4$ **2.** $f(x) = (x - 3)^2$ **3.** $f(x) = (x + 2)^2 - 1$

Identify the vertex, axis of symmetry, the maximum or minimum value, and the domain and the range of each function.

4. $y = (x - 2)^2 + 3$ **5.** $f(x) = -0.2(x + 3)^2 + 2$ **6.** $y = (x + 4)^2 - 1$

Write the equation of each parabola in vertex form.

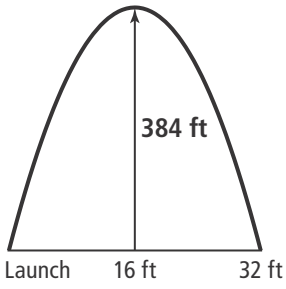
7. vertex (3, −2), point (2, 3)

8. vertex (−4, −24), point (−5, −25)

9. vertex (−12.5, 35.5), point (1, 400)

10. Given the function $f(x) = x^2$, Write the equation function $g(x)$ whose graph is a translation 5 units left and 3 units down.

11. The diagram shows the path of a model rocket launched from the ground. It reaches a maximum altitude of 384 ft when it is above a location 16 ft from the launch site. What quadratic function models the height of the rocket?



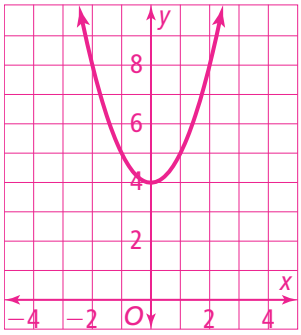
2-1 Additional Practice

Vertex Form of a Quadratic Function

Graph each function. Describe how it was translated from $f(x) = x^2$.

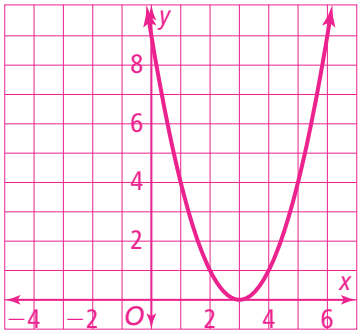
1. $f(x) = x^2 + 4$

translated up 4 units



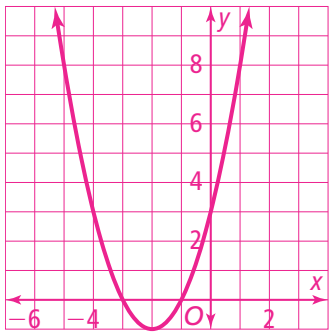
2. $f(x) = (x - 3)^2$

translated right 3 units



3. $f(x) = (x + 2)^2 - 1$

translated 1 unit down and 2 units left



Identify the vertex, axis of symmetry, the maximum or minimum value, and the domain and the range of each function.

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

Vertex: (2, 3); Axis of Symmetry: $x = 2$; Minimum: $y = 3$; Domain: $(-\infty, \infty)$; Range: $(3, \infty)$

5. $f(x) = -0.2(x + 3)^2 + 2$

Vertex: (−3, 2); Axis of Symmetry: $x = -3$; Maximum: $y = 2$; Domain: $(-\infty, \infty)$; Range: $(-\infty, 2]$

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

Vertex: (−4, −1); Axis of Symmetry: $x = -4$; Minimum: $y = -1$; Domain: $(-\infty, \infty)$; Range: $(-1, \infty)$

Write the equation of each parabola in vertex form.

7. vertex (3, −2), point (2, 3)

$y = 5(x - 3)^2 - 2$

8. vertex (−4, −24), point (−5, −25)

$y = -(x + 4)^2 - 24$

9. vertex (−12.5, 35.5), point (1, 400)

$y = 2(x + 12.5)^2 + 35.5$

10. Given the function $f(x) = x^2$, Write the equation function $g(x)$ whose graph is a translation 5 units left and 3 units down. $g(x) = (x + 5)^2 - 3$

11. The diagram shows the path of a model rocket launched from the ground. It reaches a maximum altitude of 384 ft when it is above a location 16 ft from the launch site. What quadratic function models the height of the rocket?

$f(x) = -1.5(x - 16)^2 + 384$