



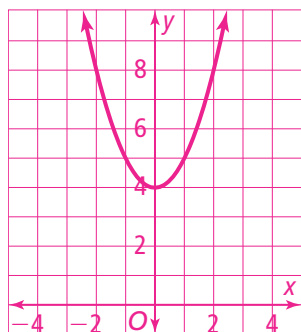
2-1 Additional Practice

Vertex Form of a Quadratic Function

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

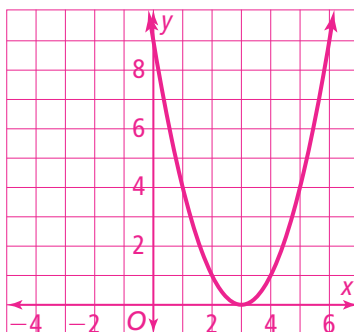
1. $f(x) = x^2 + 4$

translated up
4 units



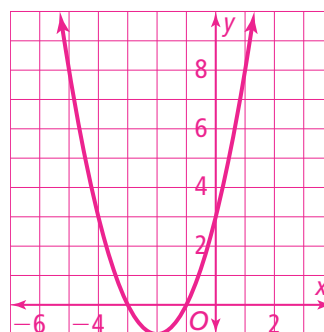
2. $f(x) = (x - 3)^2$

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?

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

