Parabolas

Write each equation in standard form. Identify the vertex, axis of symmetry, and direction of opening of the parabola.

1. $y = x^2 + 2x + 2$
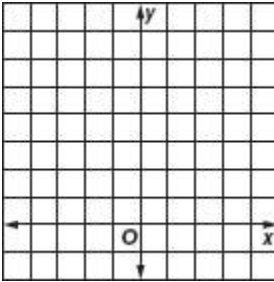
2. $y = x^2 - 2x + 4$

3. $y = x^2 + 4x + 1$

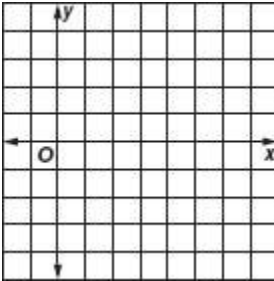4. $y = -2x^2 + 12x - 14$

5. $x = 3y^2 + 6y - 5$

6. $x + y^2 - 8y = -20$
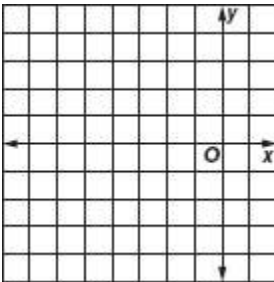
Graph each equation.

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

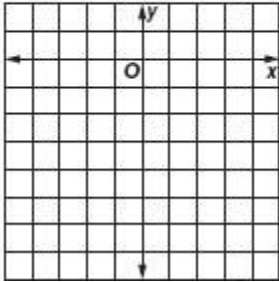5. $x = (y - 2)^2 + 3$

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

Write an equation for each parabola described below. Then graph the equation.
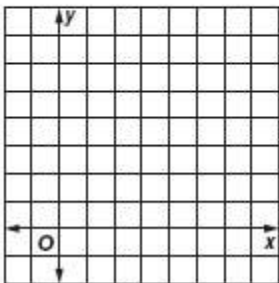
7. vertex (0, 0),

    focus $\left(0, -\frac{1}{12}\right)$

8. vertex (5, 1),

    focus $\left(5, \frac{5}{4}\right)$

9. vertex (1, 3),

directrix $x = \dfrac{7}{8}$