Parabolas

Write each equation in standard form. Identify the vertex, axis of symmetry, and direction of opening of the parabola.
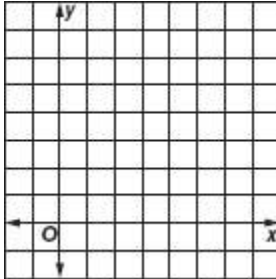
1. $y = 2x^2 - 12x + 19$

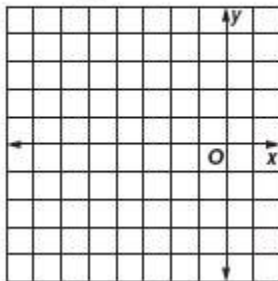2. $y = \frac{1}{2}x^2 + 3x + \frac{1}{2}$

3. $y = -3x^2 - 12x - 7$

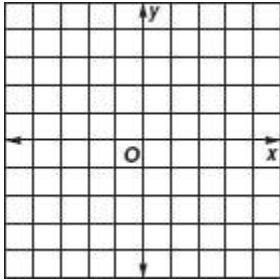**Graph each equation.**

4. $y = (x - 4)^2 + 3$
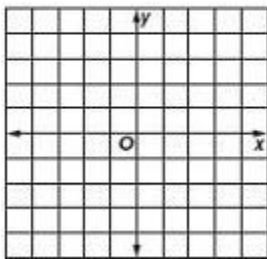
5.

$x = -\frac{1}{3}y^2 + 1$
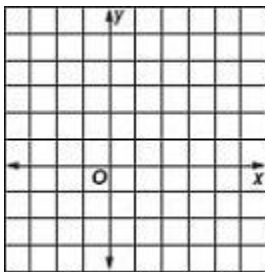
6. $x = 3(y + 1)^2 - 3$

Write an equation for each parabola described below. Then graph the equation.
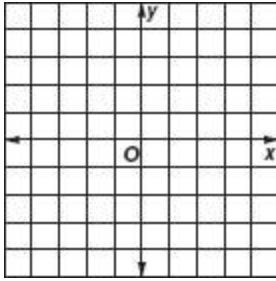
7. vertex (0, -4),
    focus $\left(0, -3\frac{7}{8}\right)$

8. vertex (-2, 1),
    directrix $x = -3$

9. vertex (1, 3),
    latus rectum: 2 units, $a < 0$

10. **TELEVISION** Write the equation in the form $y = ax^2$ for a satellite dish. Assume that the bottom of the upward-facing dish passes through (0, 0) and that the distance from the bottom to the focus point is 8 inches.