

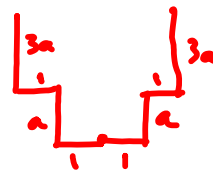
Parabolas and Circles

The vertex form of a quadratic function (graph opening up and down):

$$f(x) = a(x-h)^2 + k$$

Vertex: (h, k)

\cup $a > 0$ \cap $a < 0$
Axis of Symmetry: $x = h$



If the function is given in standard form, the vertex formula is: $f(x) = ax^2 + bx + c$

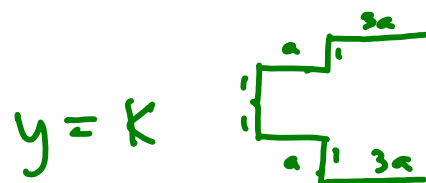
Vertex: $(-\frac{b}{2a}, f(-\frac{b}{2a}))$

The vertex form of a parabola opening left or right:

$$x = a(y-k)^2 + h$$

Vertex: (h, k)

Axis of Symmetry: $y = k$

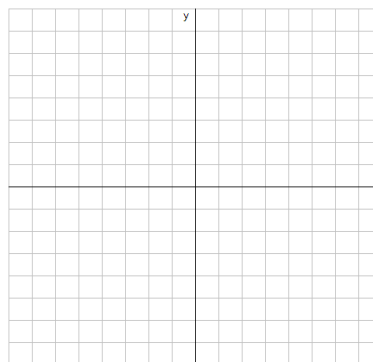


If the equation is given in standard form, the vertex formula is:

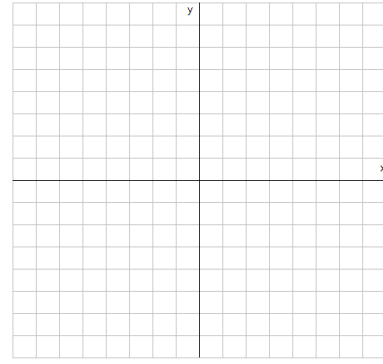
$$f(y) = ay^2 + by + c$$

Vertex: $(f(-\frac{b}{2a}), -\frac{b}{2a})$

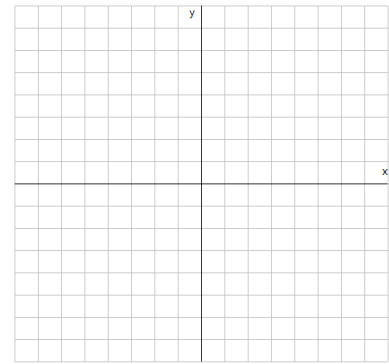
$$x = (y-4)^2 - 1$$



$$X = y^2 - 6y + 6$$



$$X = -3y^2 + 6y + 1$$



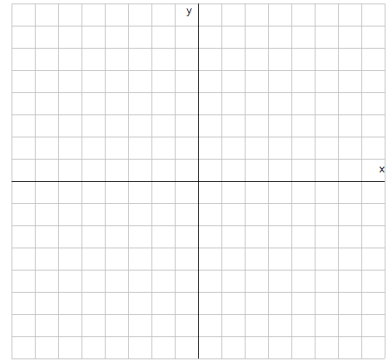
General Form of the Equation of a Circle:

$$(x-h)^2 + (y-k)^2 = r^2$$

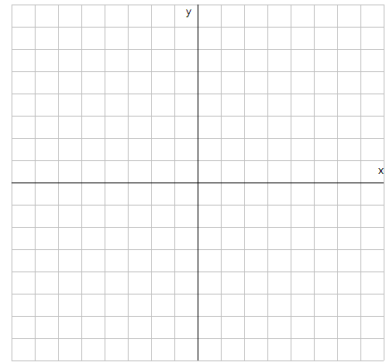
Center: (h, k) Radius: r

Find the equation of the circle having radius 2 and center at $(-7, 6)$:

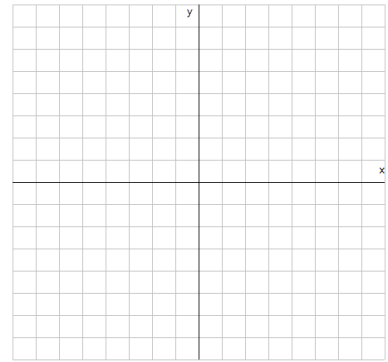
$$x^2 + y^2 = 25$$



$$4x^2 + 4y^2 = 8$$



$$x^2 + 10x + y^2 = 0$$



$$2x^2 + 12x + 2y^2 - 8y = 6$$

