Conic Sections: The Parabola

A parabola is set of all points (x, y) that are

_____

_____
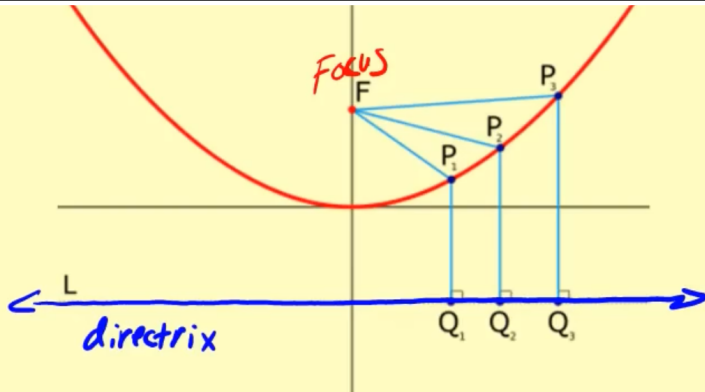
Standard Form of an Equation of a Parabola
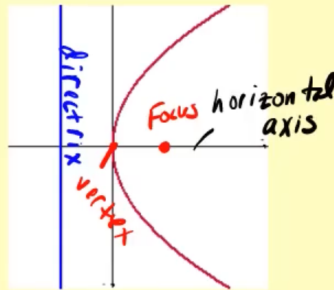
A parabola with vertex (h,k) and directrix $y = k - a$ is

_____ (_____ Axis)

For directrix $x = h - a$, the equation is

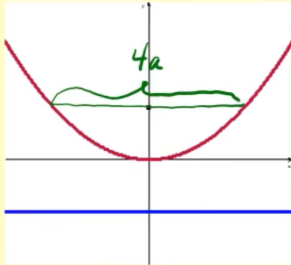_____ (_____ Axis)

Continues on next page

$$(x-h)^2 = 4a(y-k) \qquad (y-k)^2 = 4a(x-h)$$

The ____ lies on the axis **a** units (directed distance) from the vertex. The coordinates of the focus are as follows:

(h, k + a) (Vertical Axis) **(h + a, k)** (Horizontal Axis)

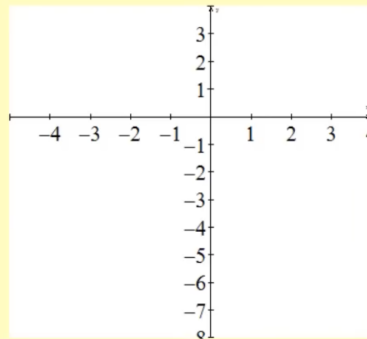The latus rectum is the chord through a focus parallel to the directrix. **The latus rectum has length** ____

4a

4a

Graph.

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

(Vertical Axis)
$(x-h)^2 = 4a(y-k)$

vertex (h,k)
directrix y = k − a
Focus: (h, k + a)

Graph.

$$(y+2)^2 = -8(x-1)$$

(Horizontal Axis)
$(y-k)^2 = 4a(x-h)$

Vertex (h,k)
Directrix: x = h − a
Focus: (h + a, k)