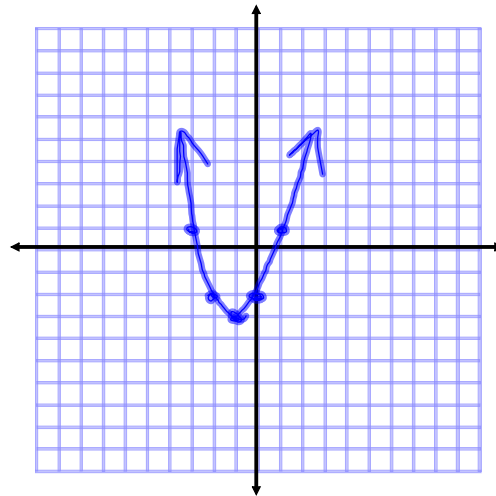


Warm-Up:

Graph.

$$y = (x + 1)^2 - 3$$

x	y
0	$(0+1)^2 - 3 = -2$
1	$(1+1)^2 - 3 = 1$
-1	$(-1+1)^2 - 3 = -3$
-2	$(-2+1)^2 - 3 = -2$
-3	$(-3+1)^2 - 3 = 1$

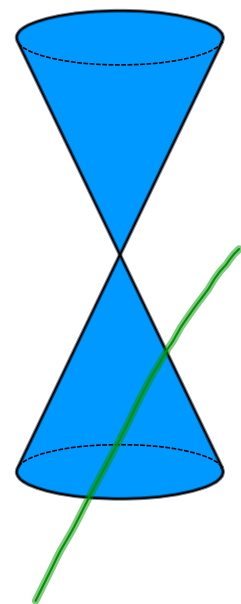


29-35

43-46

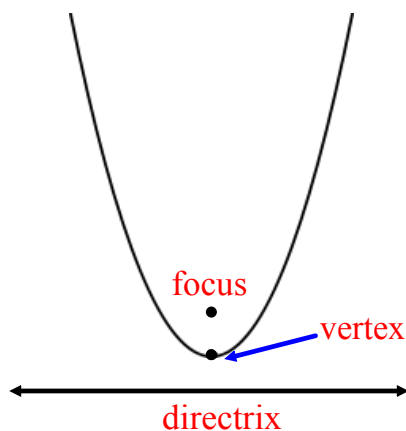
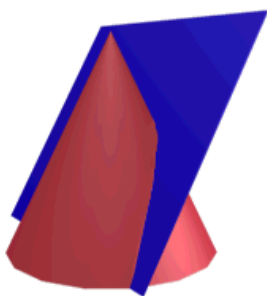
Section 10-2: Parabolas

Any figure obtained by slicing a double cone is called a conic section.



One example of a conic section is a parabola.

A parabola is the set of all the points that are the same distance from a fixed point, called the focus, and a given line, called the directrix.



Graphing a parabola:

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

When $a > 0$, opens up.
When $a < 0$, opens down.

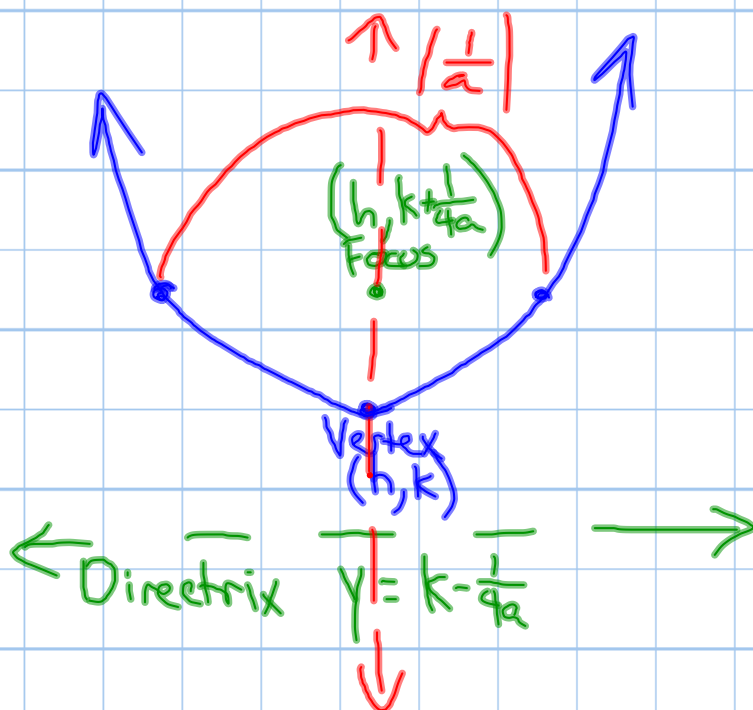
Vertex: (h, k)

Focus: $(h, k + \frac{1}{4a})$

Directrix: $y = k - \frac{1}{4a}$

Axis of Symmetry: $x = h$

Length of Latus Rectum: $|\frac{1}{a}|$



Graphing a parabola:

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

When $a > 0$, opens right.

When $a < 0$, opens left.

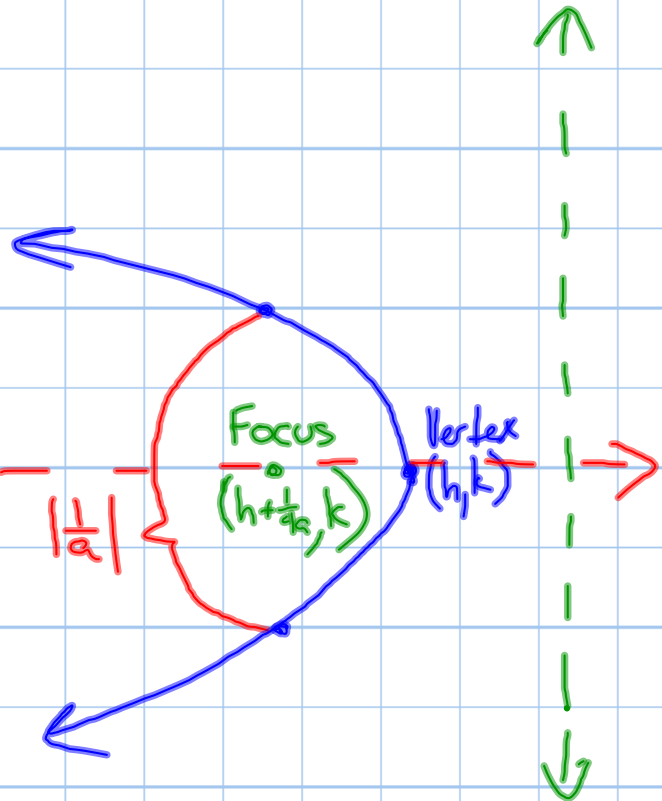
Vertex: (h, k)

Focus: $(h + \frac{1}{4a}, k)$

Directrix: $x = h - \frac{1}{4a}$

Axis of Symmetry: $y = k$

Length of Latus Rectum: $|\frac{1}{a}|$



1) Identify the coordinates of the vertex and focus, the equations of the directrix and axis of symmetry, and the direction of the opening of the given equation for a parabola. Then find the length of the latus rectum and graph.

$y = 2x^2$ $a = 2$ $h = 0$ $k = 0$ $\frac{1}{4(2)} = \frac{1}{8}$

Vertex: $(0, 0)$

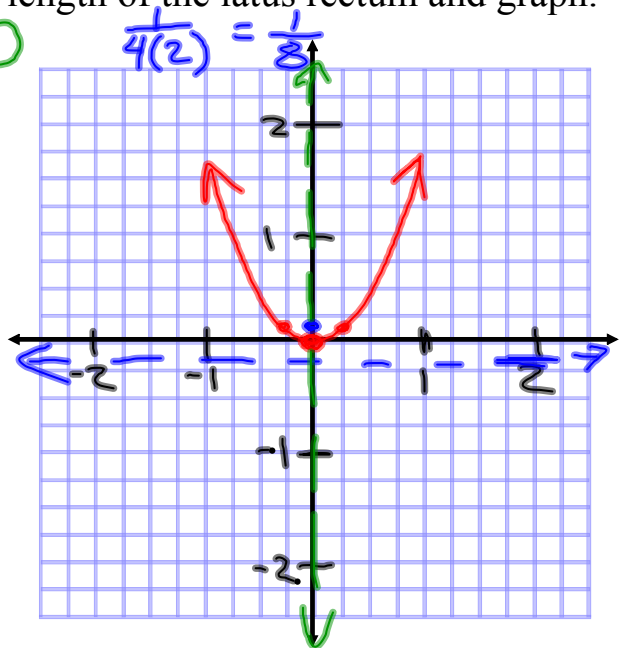
Focus: $(0, \frac{1}{8})$

Directrix: $y = -\frac{1}{8}$

Axis of Symmetry: $x = 0$

Opening: Up

Length of LR: $|\frac{1}{2}| = \frac{1}{2}$



2) Identify the coordinates of the vertex and focus, the equations of the directrix and axis of symmetry, and the direction of the opening of the given equation for a parabola. Then find the length of the latus rectum and graph.

$$a=2 \quad h=-5 \quad k=1$$
$$x = 2(y - 1)^2 - 5$$

Vertex: $(-5, 1)$

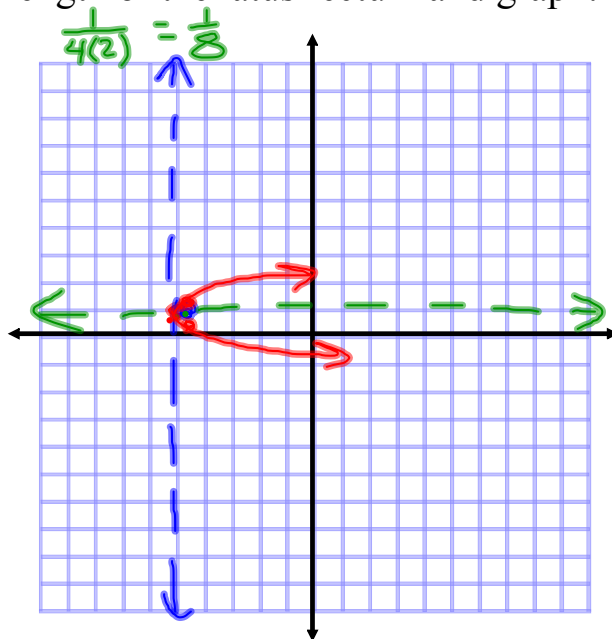
Focus: $(-4\frac{7}{8}, 1)$

Directrix: $x = -5\frac{1}{8}$

Axis of Symmetry: $y = 1$

Opening: Right

Length of LR: $|\frac{1}{2}| = \frac{1}{2}$



Homework: Worksheet 10-2

SHOW YOUR WORK FOR CREDIT.