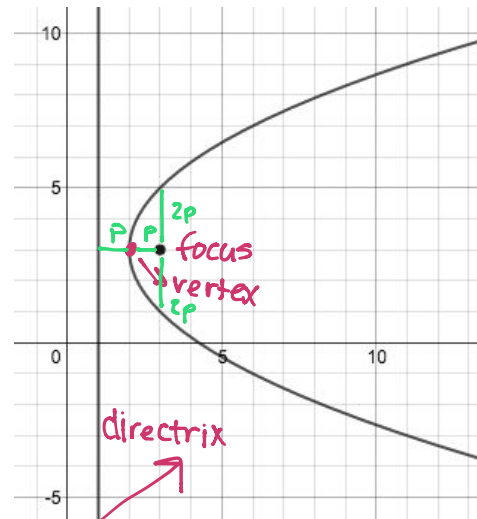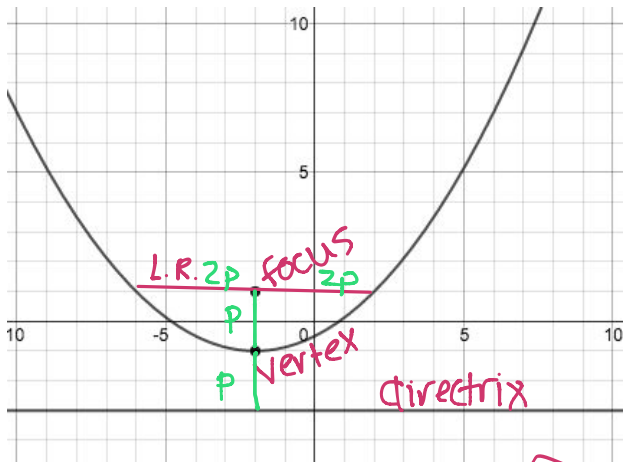# PARABOLAS WORKSHEET

Part 1: A parabola is the set of all points (x, y) that are equidistant from a line (the directrix) and a point (the focus).

1. On each graph, label the following: Focus, Directrix, Axis, Vertex, Distance between vertex and focus (called "p", and the Latus Rectum.

A general parabola has one of the following equations, depending on its axis of orientation.

y term squared: Horizontal axis. Vertex at (h, k). $(y - k)^2 = 4p \cdot (x - h)$	x term squared: Vertical axis. Vertex at (h, k). $(x - h)^2 = 4p \cdot (y - k)$

- p is the distance from the vertex $\leftrightarrow$ focus and vertex $\leftrightarrow$ directrix. The sign of p determines the direction.
- The length of the latus rectum is equal to $4p$, which means that half of the L.R. is the same as directrix $\leftrightarrow$ focus.

2. For each box, fill in any missing information. Plot the vertex, focus, and directrix. Draw the latus rectum, then sketch the parabola between the three points.

Axis: Vertical

Focus: $(0, 2)$

$p =$ __2__

$8 = 4p$
$P = 2$

Vertex: $(0, 0)$

Directrix: $y = -2$

Equation: $x^2 = 8y$

$(x-0)^2 = 8(y-0)$

$2 \cdot P \qquad 2P$

Axis: Horizontal

Focus: $(3, 0)$

$p =$ __3__

$4p = 12$

$P = 3$

Vertex: $(0, 0)$

Directrix: $x = \dfrac{-3}{}$

Equation: $y^2 = 12x$

$(y-0)^2 = 12(x-0)$

$2P$

$2P$

Homework

Axis: Vertical   Vertex: $(-2, 1)$

Focus: $(-2, 3)$ Directrix: _____

$p =$ _____   Equation: _____

Axis: _____   Vertex: _____

Focus: _____   Directrix: $y = 1$

$p =$ _____   Equation: $(x+2)^2 = -4y$
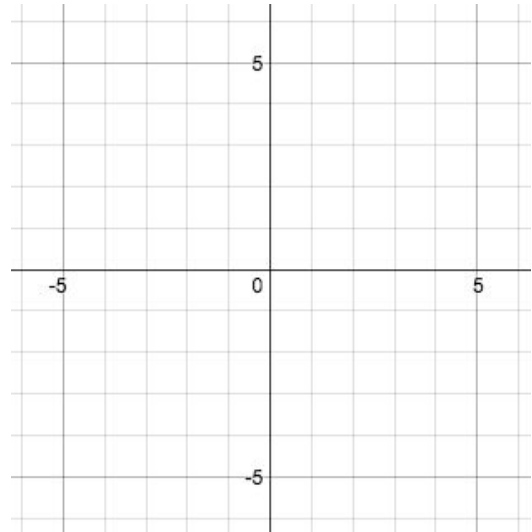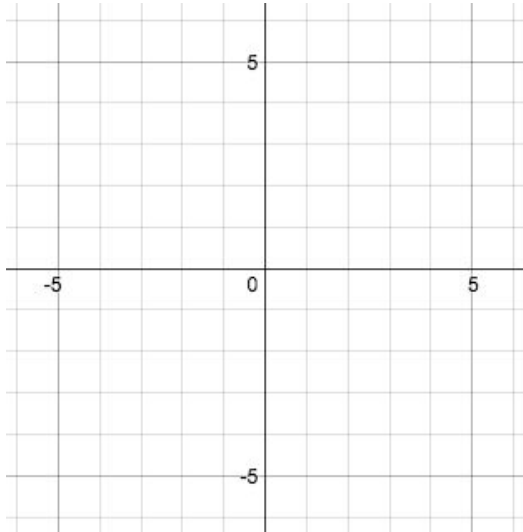
Axis: Horizontal   Vertex: $(-4, 1)$

Focus: To right of vertex   Directrix: _____

$p = 2$ Equation: _____

Axis: _____   Vertex: $(3, -4)$

Focus: _____   Directrix: $x = 4$

$p =$ _____   Equation: _____