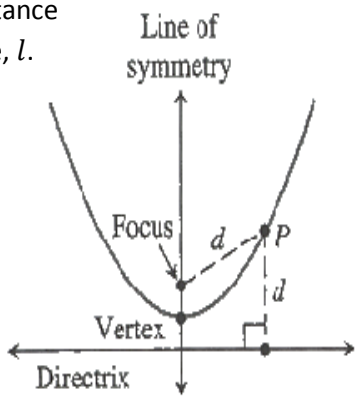
Directrix and Focus of a parabola **Name: _____**

What *really* is a parabola?

A parabola is a _____ of points P in a plane, whose distance from a fixed point, *F*, is the _____ as the distance from a fixed line, l. That is _____.



The fixed point, *F*, is called the _____.
The line, l, is called the _____.

A ray that travels _____to the axis of symmetry will strike the surface of the parabola or paraboloid and _____ toward the focus.

Likewise, when a ray from the _____ strikes the curve, it will reflect in a ray that is parallel to the _____.

Draw diagrams here:

Example One: **Find the vertex if the focus is located at (1, 4) and directrix is $y = -3$.**

Example Two: **If the vertex is (-2, 2), and the focus is (-2, -4), what is the equation of the directrix?**

Example Three: **If the directrix is $y = 3$, and the vertex is (6,2), where is the focus?**

How to determine scale factor:

The distance from the vertex to the focus is equal to $\frac{1}{4a}$.

Example Four: Write the equation of the parabola with focus (1,3) and directrix $y = -1$

Example Five: Find all important information for the conic section with an equation:

$$y = \frac{-1}{4}(x+4)^2 - 4$$

Example Six: A parabola has a directrix at *y* = 6 and a focus at (-6,0). What is the equation of the parabola?

Example Seven: **Sheila is designing a parabolic dish to use for cooking on a camping trip. She plans to make the dish 40cm wide and 20 cm deep. Where should she locate the cooking grill so that all the light that enters the parabolic dish will be reflected toward the food?**