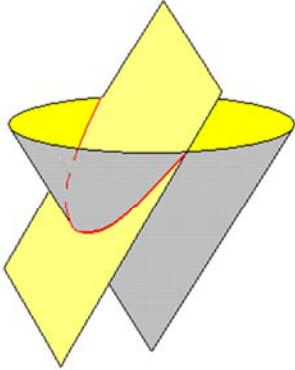


Name: \_\_\_\_\_  
PCH: Conic Sections: Parabolas

Date: \_\_\_\_\_  
Ms. Loughran

Do Now:  
On Google Classroom (8 minutes)

A **parabola** is the curve formed by the intersection of a plane and a cone, when the plane is at the same slant as the side of the cone.



A parabola can also be defined as the set of all points in a plane which are an equal distance away from a given point (called the **focus** of the parabola) and a given line (called the **directrix** of the parabola).

Parabola with vertical axis of symmetry:

Parabola with horizontal axis of symmetry:

Vertex:

Vertex:

Focus:

Focus:

Directrix:

Directrix:

Axis of symmetry:

Axis of symmetry:

Directions for #s 1-6: For each of the following, state the coordinates of the vertex and the focus and the equation of the directrix of the parabola defined by each equation. Then sketch a graph containing a minimum of 3 points.

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

2.  $(y+2)^2 = -16(x-3)$

Vertex: \_\_\_\_\_

Vertex: \_\_\_\_\_

Focus: \_\_\_\_\_

Focus: \_\_\_\_\_

Directrix: \_\_\_\_\_

Directrix: \_\_\_\_\_

Axis of symmetry: \_\_\_\_\_

Axis of symmetry: \_\_\_\_\_

3.  $x^2 - 2x + 1 = 8y - 16$

4.  $y^2 + 6y + 9 = 16 - 16x$

Vertex: \_\_\_\_\_

Vertex: \_\_\_\_\_

Focus: \_\_\_\_\_

Focus: \_\_\_\_\_

Directrix: \_\_\_\_\_

Directrix: \_\_\_\_\_

Axis of symmetry: \_\_\_\_\_

Axis of symmetry: \_\_\_\_\_

5.  $-4x + 4 = y^2 + 10y + 25$

6.  $x^2 + 8x + 4y + 8 = 0$

Vertex: \_\_\_\_\_

Vertex: \_\_\_\_\_

Focus: \_\_\_\_\_

Focus: \_\_\_\_\_

Directrix: \_\_\_\_\_

Directrix: \_\_\_\_\_

Axis of symmetry: \_\_\_\_\_

Axis of symmetry: \_\_\_\_\_

For 7 and 8, identify the vertex, axis of symmetry, directrix, direction of opening of each.

7.  $-2x^2 - 4x + y + 70 = 0$

8.  $2y^2 + x + 20y + 51 = 0$

For 9-13, use the information provided to write the equation of the parabola in vertex form.

9. focus:  $(1,3)$  and vertex:  $(1,2)$

10. focus:  $(2,1)$  and directrix:  $x = -2$

11. vertex at the origin and focus:  $(-2,0)$

12. vertex:  $(-7,9)$  , opens left or right, and passes through  $(-4,8)$

13. vertex at the origin, horizontal axis of symmetry, and passes through  $(4,6)$