Integrated Math 3
Unit 1: Analytic Geometry
1.16

Name: _____

Date:_____ Period:_____

Objective: Writing and graphing equations of parabolas

Warm Up: Given the circle equation: $x^2 + y^2 + 4x - 6y + 9 = 0$

A.) Determine the center

B.) Determine the radius

C.) Determine the area

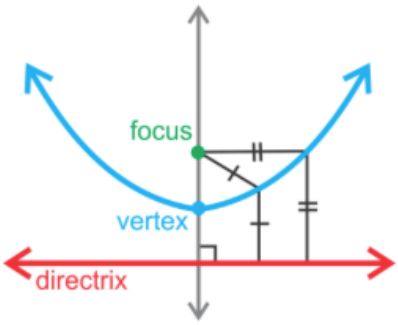
D.) Determine the circumference

Key Terms:

Parabola: a relation that has the property that any point on it is equidistant from a point called the **focus** and a line called the **directrix.**

Vertex: a point that lies halfway between the focus and directrix

Focus: a point that lies on the axis of symmetry (every point lying on parabola is equidistant to the focus)



Directrix: a line that is perpendicular to the axis of symmetry

Axis of Symmetry: a line that cuts the parabola in half

Parabolas have an awesome property such that the _____ from the vertex to the focus & the _____ from the vertex to the directrix is _____. We call this distance _____.

When a parabola opens up or down	When a parabola opens right or left
$(x-h)^2 = 4p(y-k)$	$(y-k)^2 = 4p(x-h)$

Example 1: Determine the direction the parabola opens & draw a brief sketch.

A.) $8y = x^2$

B.) $-x = y^2$

C.) $-4y = x^2$

D.) $2x = y^2$

Example 2: Graph each parabola and list the vertex, p-value, focus, and directrix.

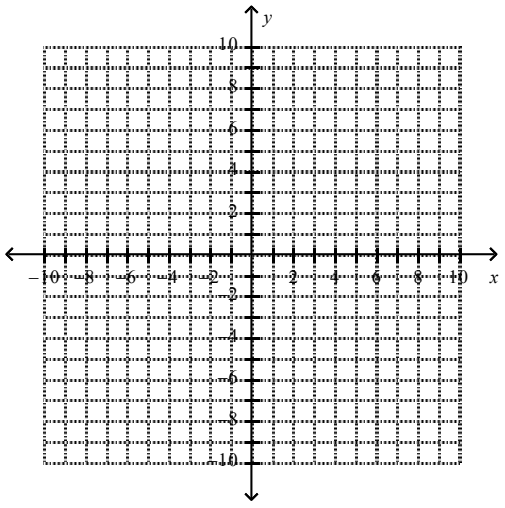
A.) $(y-4)^2 = 8(x+2)$

Vertex:

p-value:

Focus:

Directrix:



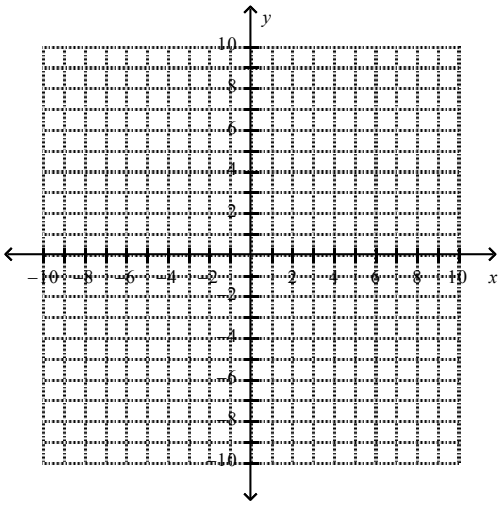
B.) $(x+3)^2 = -12(y-3)$

Vertex:

p-value:

Focus:

Directrix:



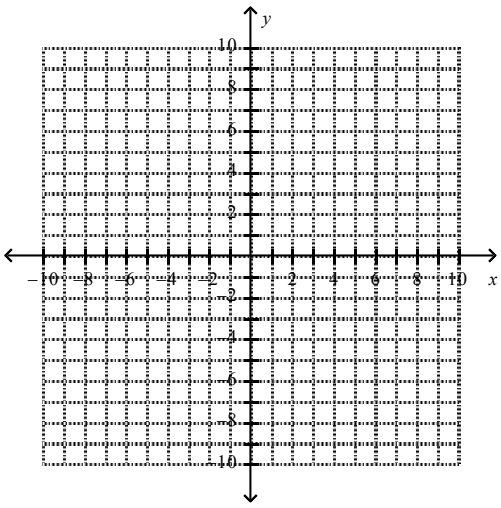
C.) $(y+3)^2 = -16\,(x-5)$

Vertex:

p-value:

Focus:

Directrix:



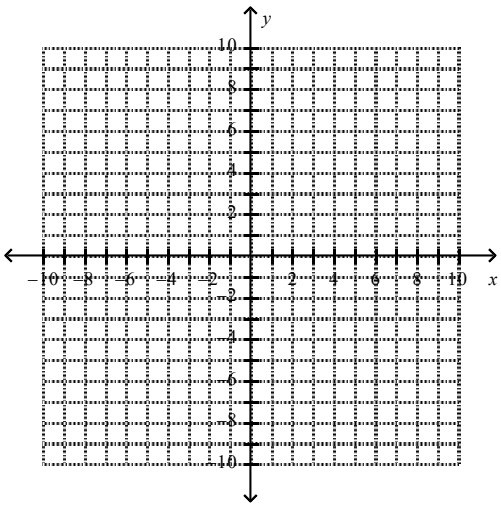
D.) $(x-6)^2 = 6y$

Vertex:

p-value:

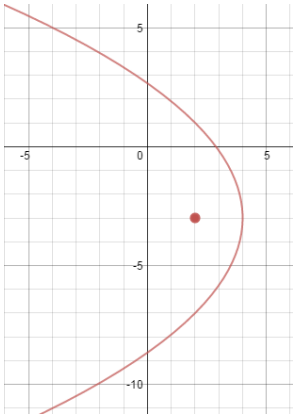
Focus:

Directrix:



Example 3: Analyze the following graphs in order in order to provide the missing information.

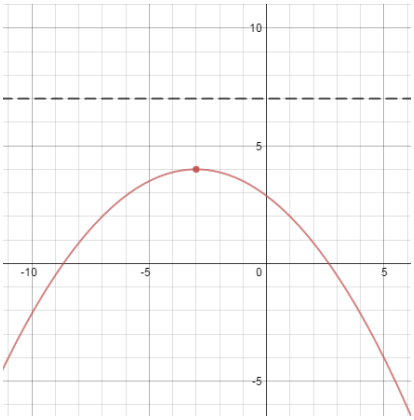
a.)



Directrix:

Equation:

b.)



Focus:

Equation: