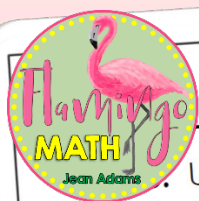


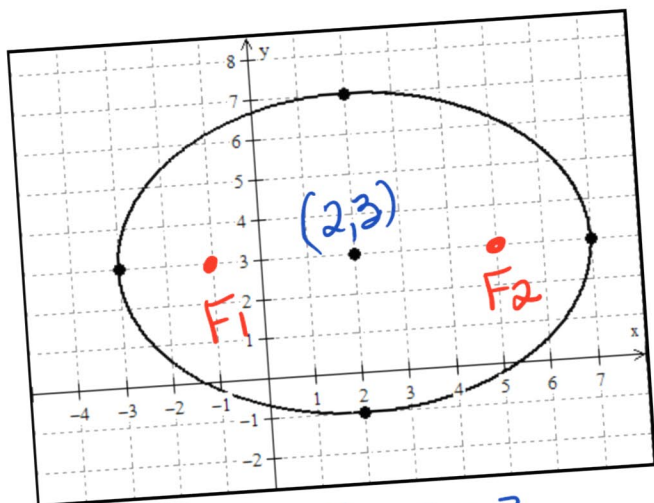
Algebra 2 Honors

Conic Sections



Working Backwards from a Graph

Use the sketch of the ellipse to complete the chart:



$$a=5 \quad b=4 \quad c=3$$

Center:	$(2, 3)$
Major axis:	horizontal
Major Vertices	$(-3, 3)$ $(7, 3)$
Minor Vertices	$(2, -1)$ $(2, 7)$
Foci:	$(-1, 3)$ $(5, 3)$
Standard Form:	$\frac{(x-2)^2}{25} + \frac{(y-3)^2}{16} = 1$

Guided Notes

10

Completely Editable

ALGEBRA 2 CURRICULUM

Scope and Sequence

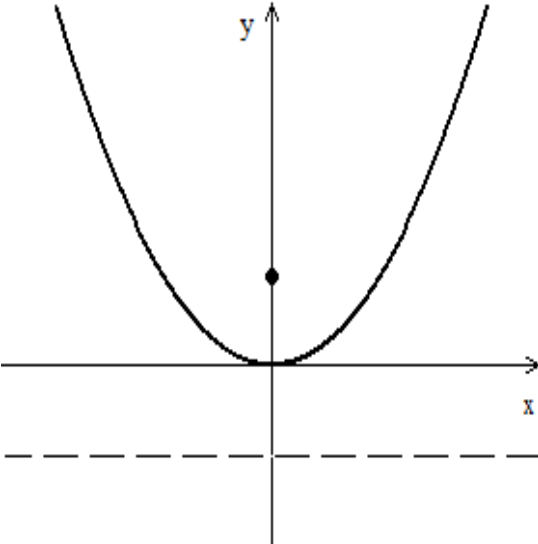
Unit 10: Conic Sections

Lesson	Skills & Learning Objectives
[10.1] Parabolas	☐ Find the equation, focus, and directrix of a parabola ☐ Write, analyze and graph the equation of a parabola, including completing the square ☐ Understand the impact of parameters on graphs of parabolas
[10.2] Circles	☐ Write, analyze and graph the equation of a circle ☐ Find the center and radius of a circle on a coordinate plane and use them to graph the circle ☐ Write standard form equations for a circle by completing the square ☐ Solve real-world problems involving circles
[10.3] Ellipses	☐ Write, analyze and graph the equation of an ellipse ☐ Find the equation, foci, major and minor vertices of an ellipse, as well as completing the square ☐ Solve real-world problems involving ellipses
[10.4] Hyperbola	☐ Write, analyze and graph the equation of a hyperbola ☐ Find the equation, foci, major and minor vertices and asymptotes for hyperbolas ☐ Complete the square to write standard form of a hyperbola ☐ Solve real-world problems involving hyperbolas

Lesson 1: Parabolas

DEFINITION OF A PARABOLA

A parabola is the set of all points in a plane that are the same distance from the _____ (a fixed line) and the _____, a fixed point not on the line.

Verbal Vocabulary	Visual Vocabulary
The _____ is a fixed line that is used to define a parabola. Each point of the parabola is the same distance from the focus and the directrix. The _____ a fixed point that is the same distance from a fixed line and every point on the parabola. The directed distance between the vertex and the focus of the parabola is called the _____.	

Parabolas with Vertical Axis of Symmetry

Standard Form:		
Vertex Form:		
Opens		
Vertex		
Focus		
Directrix		
Axis		

Lesson 2: Circles

DEFINITION OF A CIRCLE

A circle is the (locus) set of all points (x, y) in a plane whose distance from a _____ point in the plane is _____ (equidistant).

Verbal Vocabulary

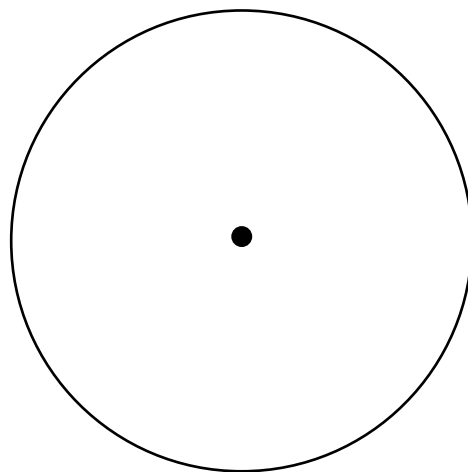
The _____ is the point that is the same distance from every point on the circle.

The distance between the center of the circle and any point on the circumference is called the _____.

Standard form of an equation of a circle
Center at $(0, 0)$ and radius r :

Center at (h, k) and radius r :

Visual Vocabulary



Writing an Equation of a Circle

EX #1: Write the equation of a circle with the following characteristics:

A. The center is at the origin and the radius is 7.

B. The center is $(5, -2)$ and the radius is 8.

Lesson 3: Ellipses

DEFINITION OF AN ELLIPSE

An ellipse is the set of all points P in a plane whose sum of the distances from P to two fixed points F_1 and F_2 is a given sum k .

Verbal Vocabulary	Visual Vocabulary
The _____ of an ellipse is the point on the focal axis midway between the foci. The segment that contains the foci of the ellipse and has endpoints on the ellipse is known as the _____ axis, while the segment that is perpendicular to the major axis at its midpoint and has endpoints on the ellipse is called the _____ axis. The endpoints of the minor axis are known as _____. The _____, plural of focus, are the fixed points equidistant from the center and located on the focal axis (major axis).	

Ellipses with Center (0, 0)

Equation		
Major Axis		
Foci		
Vertices		
Co-vertices		
Pythagorean Relation		

Graphing Basic Hyperbolas

EX #1: Find the vertices, foci, and asymptotes of the hyperbola. Then sketch.

$$\frac{x^2}{9} - \frac{y^2}{16} = 1$$

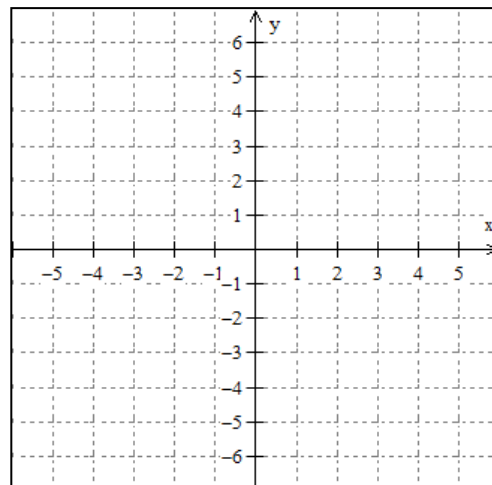
$a =$ _____ $b =$ _____ $c =$ _____

Major vertices: _____

Minor vertices: _____

Foci: _____

Asymptotes: _____



Writing an Equation of a Hyperbola

EX #2: Find the equation in standard form for a hyperbola centered at the origin whose foci are $(0, \pm\sqrt{5})$ and vertices $(0, \pm 2)$. Sketch the hyperbola.

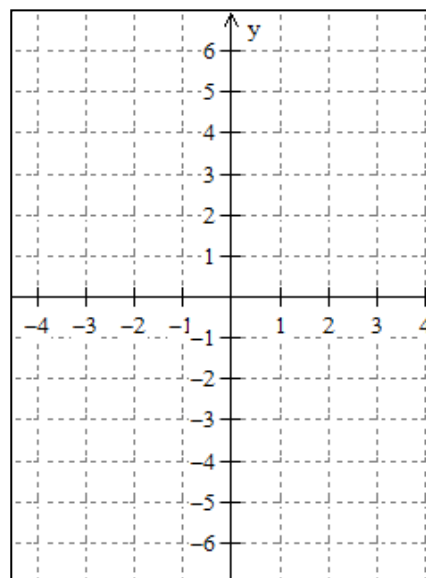
$a =$ _____ $b =$ _____ $c =$ _____

Equation: _____

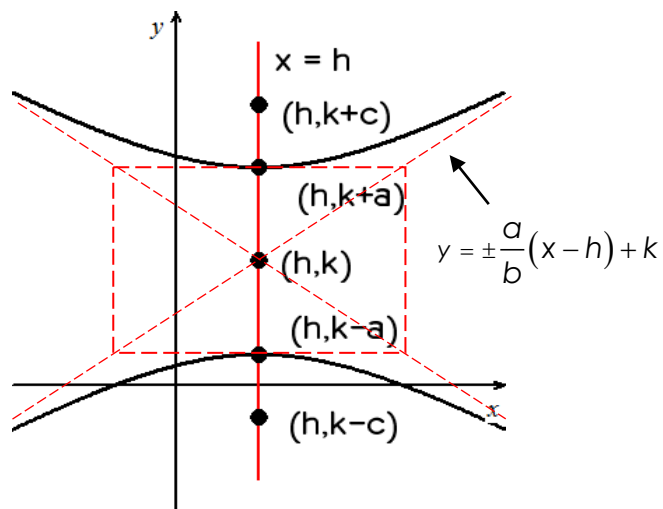
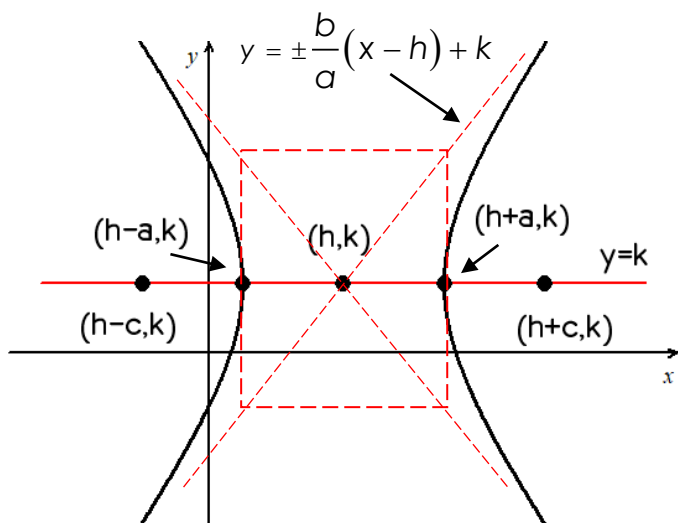
Vertices: _____

Transverse Axis: _____

Asymptotes: _____



Hyperbolas with Center (h, k)



Equation	$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$	$\frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$
Transverse Axis		
Foci		
Vertices		
Pythagorean Relation		
Asymptotes		

EX #5: Graph the hyperbola. $\frac{(y-3)^2}{9} - \frac{(x-2)^2}{16} = 1$

$a = \underline{\hspace{2cm}}$ $b = \underline{\hspace{2cm}}$ $c = \underline{\hspace{2cm}}$

Transverse axis: $\underline{\hspace{4cm}}$

Center: $\underline{\hspace{4cm}}$

Major vertices: $\underline{\hspace{4cm}}$

Minor vertices: $\underline{\hspace{4cm}}$

Foci: $\underline{\hspace{4cm}}$

Asymptotes: $\underline{\hspace{4cm}}$

