

8.2 & 8.3 Ellipses & Hyperbolas

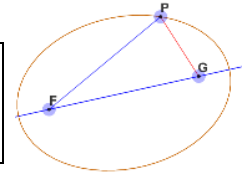
Target 4C/4E: Investigate the geometric properties of ellipses/hyperbolas

Target 4D/4F: Derive the standard equation of an ellipse/hyperbola and graph given two or three criteria

Ellipse



Definition (in your own words) <https://www.mathsisfun.com/geometry/ellipse.html>

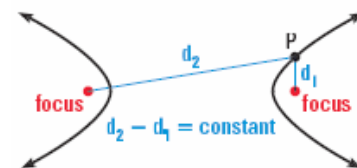


Major Axis Parallel to the x -axis		Sketch	Example
Standard Form of Equation	$\frac{(x - h)^2}{a^2} + \frac{(y - k)^2}{b^2} = 1$	<p style="text-align: center;">$a > b$</p> <p style="text-align: center;">"a is the longest distance"</p>	$\frac{(x - 1)^2}{16} + \frac{(y + 2)^2}{9} = 1$
Center			
Vertices			
Foci			
Focal Axis			
Semi-major Axis			
Semi-minor Axis			
Pythagorean relation			
Eccentricity			

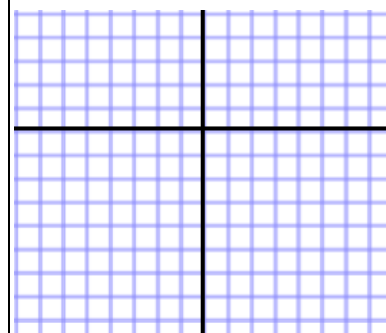
Major Axis Parallel to the y -axis		Sketch	Example
Standard Form of Equation	$\frac{(y - k)^2}{a^2} + \frac{(x - h)^2}{b^2} = 1$	<p style="text-align: center;">$a > b$</p> <p style="text-align: center;">"a is the longest distance"</p>	$\frac{(x - 1)^2}{25} + \frac{(y + 2)^2}{36} = 1$
Center			
Vertices			
Foci			
Focal Axis			
Semi-major Axis			
Semi-minor Axis			
Pythagorean relation			
Eccentricity			

Hyperbola

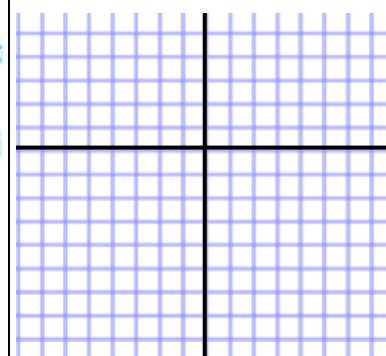
Definition (in your own words)



Transverse Axis Parallel to the x -axis (E-W)		Sketch	Example
Standard Form of Equation	$\frac{(x - h)^2}{a^2} - \frac{(y - k)^2}{b^2} = 1$	<p>a is always the 1st # in the denominator of equation</p> <p>"c is the longest distance"</p>	$\frac{(x - 1)^2}{16} - \frac{(y + 2)^2}{9} = 1$
Center			
Vertices			
Foci			
Semi-transverse Axis			
Semi-conjugate Axis			
Asymptotes			
Pythagorean relation			
Eccentricity			



Transverse Axis Parallel to the y -axis (S-N)		Sketch	Example
Standard Form of Equation	$\frac{(y - k)^2}{a^2} - \frac{(x - h)^2}{b^2} = 1$	<p>a is always the 1st # in the denominator of equation</p> <p>"c is the longest distance"</p>	$\frac{(y + 2)^2}{9} - \frac{(x - 1)^2}{25} = 1$
Center			
Vertices			
Foci			
Semi-transverse Axis			
Semi-conjugate Axis			
Asymptotes			
Pythagorean relation			
Eccentricity			

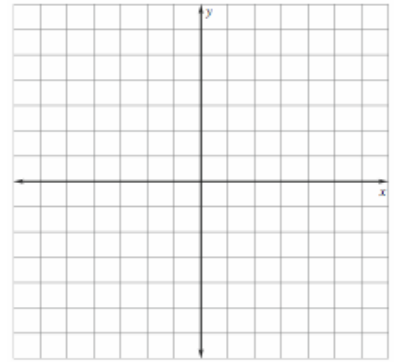


Unit 4 (Chapter 8): Conic Sections

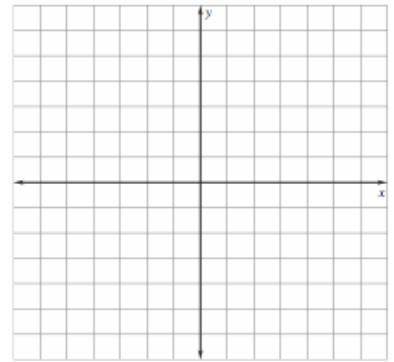
Pre-Calculus

Examples:

1. Sketch the graph of: $\frac{(x+2)^2}{16} + \frac{(y+1)^2}{25} = 1$
Label the center, vertices, and foci.



2. Sketch the graph of: $\frac{x^2}{4} - \frac{(y+1)^2}{21} = 1$
Label the center, vertices, and foci.



3. Identify the type of conic and find the center, vertices, and foci: $\frac{(x+3)^2}{16} + \frac{(y-1)^2}{4} = 1$

4. Identify the type of conic and find the center, vertices, and foci: $\frac{(y+2)^2}{9} - \frac{(x-6)^2}{16} = 1$

More Practice**Ellipses**

https://www.youtube.com/watch?v=3O_TMiP9piI

<https://www.khanacademy.org/math/algebra-home/alg-conic-sections/alg-center-and-radii-of-an-ellipse/v/conic-sections-intro-to-ellipses>

<http://www.mathwarehouse.com/ellipse/equation-of-ellipse.php>

Hyperbolas

http://www.algebralab.org/lessons/lesson.aspx?file=algebra_conics_hyperbola.xml

<http://www.purplemath.com/modules/hyperbola2.htm>

<http://www.ck12.org/book/CK-12-Algebra-II-with-Trigonometry-Concepts/section/10.9/>

<http://www.mathwarehouse.com/hyperbola/graph-equation-of-a-hyperbola.php>

<https://www.youtube.com/watch?v=FcAyzSMd0iU>

https://www.youtube.com/watch?v=Z6cwpsDC_5A

<https://www.youtube.com/watch?v=i6vM82SNAUk>

Homework Assignment

p.578 #4,5; p.590 #7-10all,37,39; p.600 #7-10all,39,41