# Day 2: Graphing Circles and Rectangular Hyperbolas

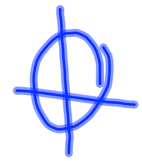
**CONICS program for calculators          Handout Investigation

wolframalpha.com

## General Form Conics

$$Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$$

$4x^2 + 4y^2 - 35 = 0$ circle



## Circle

Both +ve

$A = C$

## Ellipse

Both +ve

$A \neq C$

## Parabola

One of A or C but not both.

## Hyperbola

Opposite signs

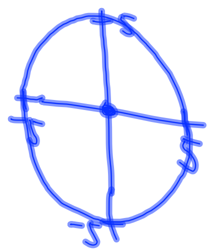
Investigate:

1) Pg. 527 #1-~~3~~2

The Equation $x^2 + y^2 = r^2$

radius

$x^2+y^2=25$ radius 5



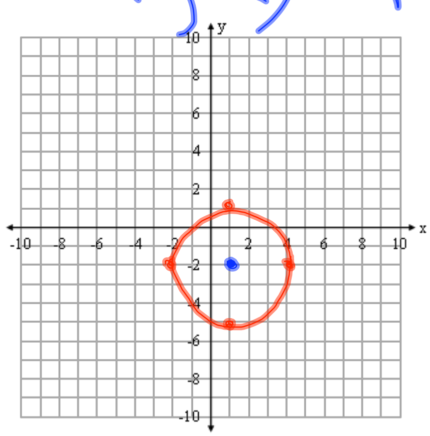

Handout Investigation I - III

The Equation $(x-h)^2 + (y-k)^2 = r^2$

$(h,k)$ center $r$ = radius

$(x-1)^2+(y+2)^2=9$

Center $(1,-2)$ $r=3$



Investigation Pg. 528 4-7

The Equation $x^2 - y^2 = r^2$

Eg. $x^2 - y^2 = 9$

Since $x^2$ is positive it tells us that the hyperbola opens along the x - axis. The coordinates of the vertices are (-3, 0) and (3,0) found by taking the square root of the constant term.

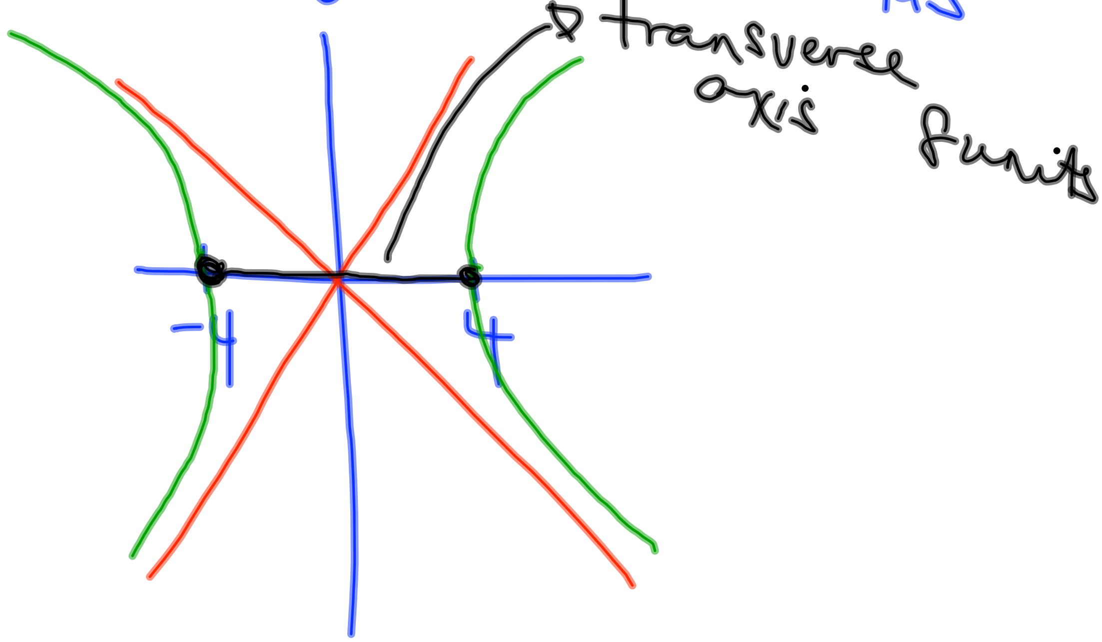
The Equation $x^2 - y^2 = -r^2$ *or* $y^2 - x^2 = r^2$ 4,5

Eg. $x^2 - y^2 = -9$ *becomes* $y^2 - x^2 = 9$

Since $y^2$ is positive it tells us that the hyperbola opens along the y - axis. The coordinates of the vertices are (0, -3) and (0, 3) found by taking the square root of the constant term.

**These hyperbolas have asymptotes of y = x and y = -x**. The line segment joining the vertices is called the **transverse axis**. In the previous examples the length of that segment is 6 units.

$x^2 - y^2 = 16$ opens along x-axis



# Assignment:
# Pg. 532 1-4, 9, 10