Notes 34a Name ___________________

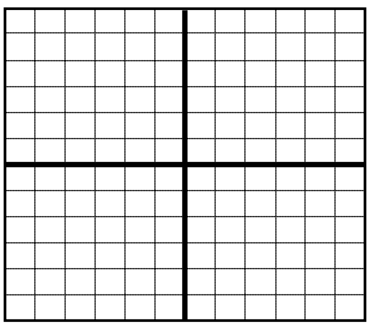
Ellipses (9.1)

Standard Forms of an Ellipse:

Horizontal Ellipse:	**Vertical Ellipse:**
$\dfrac{(x-h)^2}{a^2}+\dfrac{(y-k)^2}{b^2}=1$	$\dfrac{(x-h)^2}{b^2}+\dfrac{(y-k)^2}{a^2}=1$
Vertices: $(h \pm a, k)$	**Vertices:** $(h, k \pm a)$
Co-Vertices: $(h, k \pm b)$	**Co-Vertices:** $(h \pm b, k)$
Foci: $(h \pm c, k)$	**Foci:** $(h, k \pm c)$

Graph each ellipse and identify the center, vertices, co-vertices, and give the location of its foci.

1) $4x^2+25y^2=100$



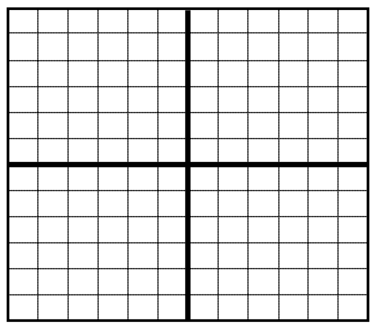
Center:

Vertices:

Co-Vertices:

Foci:

2) $16x^2+4y^2=64$



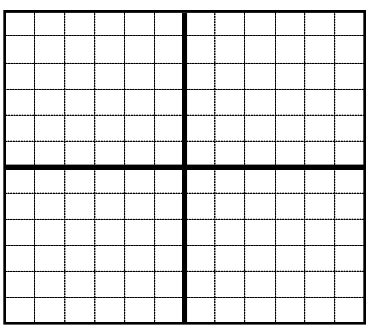
Center:

Vertices:

Co-Vertices:

Foci:

3) $\dfrac{(x-4)^2}{20}+\dfrac{(y+2)^2}{36}=1$



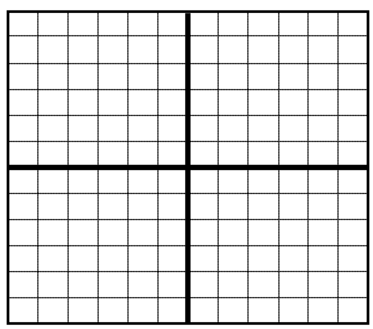
Center:

Vertices:

Co-Vertices:

Foci:

4) $\dfrac{(x+3)^2}{25}+\dfrac{(y-1)^2}{4}=1$



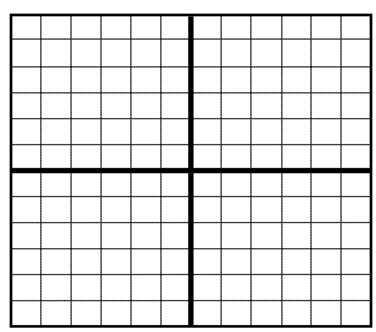
Center:

Vertices:

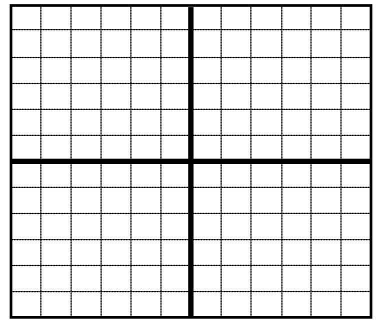
Co-Vertices:

Foci:

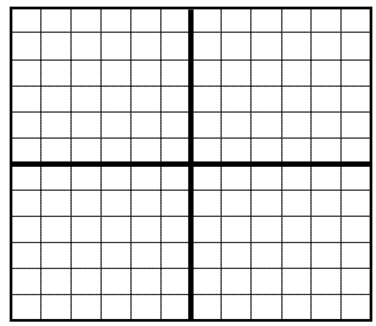
5) Write an equation of the ellipse with the vertex (-6, 0), co-vertex (0, -1), and center (0,0).



6) Write an equation of the ellipse with the center (1, 4), focus $\left(1, 4+\sqrt{12}\right)$, and Vertex (1,0),

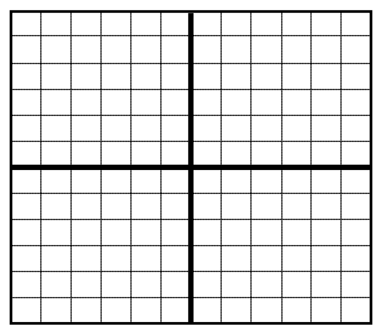


7) Write an equation of the ellipse with the vertex (-1,-2), focus (-1, -1), and center (-1, 3).



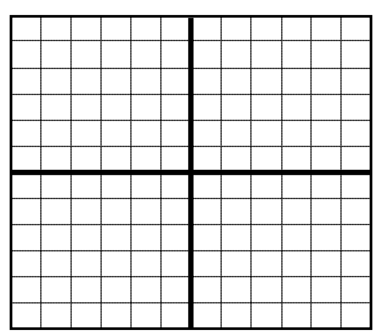
8) Write the equation of the ellipse in standard form. Then graph.

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



9) Write the equation of the ellipse in standard form. Then graph.

$x^2 + 4y^2 - 2x - 3 = 0$



Notes 34b **Name ___________________**

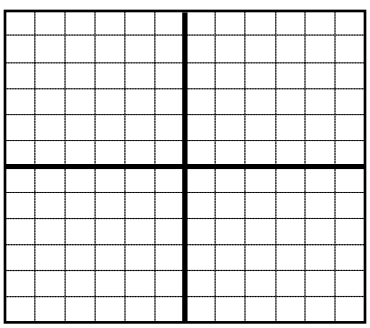
Hyperbolas (9.2)

Standard Forms of Hyperbolas:

Horizontal Hyperbola:	**Vertical Hyperbola:**
$\frac{(x-h)^2}{a^2}-\frac{(y-k)^2}{b^2}=1$	$\frac{(y-k)^2}{a^2}-\frac{(x-h)^2}{b^2}=1$
Vertices: $(h\pm a,k)$	**Vertices:** $(h,k\pm a)$
Asymptotes: $(y-k)=\pm\frac{b}{a}(x-h)$	**Asymptotes:** $(y-k)=\pm\frac{a}{b}(x-h)$
Foci: $(h\pm c,k)$	**Foci:** $(h,k\pm c)$

Graph each hyperbola and identify the vertices, the location of its foci, and the equations of its asymptotes.

1) $9x^2-16y^2=144$

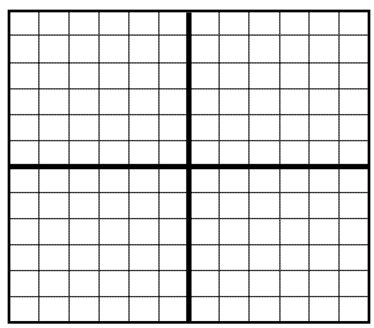


Vertices:

Foci:

Asymptotes:

2) $y^2-25x^2=25$

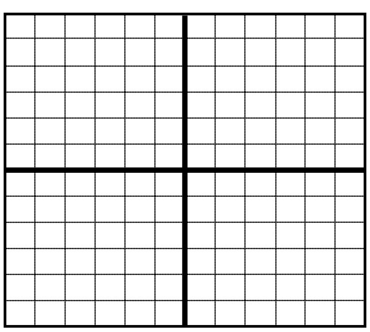


Vertices:

Foci:

Asymptotes:

3) $\frac{(x-2)^2}{4}-\frac{(y+2)^2}{16}=1$

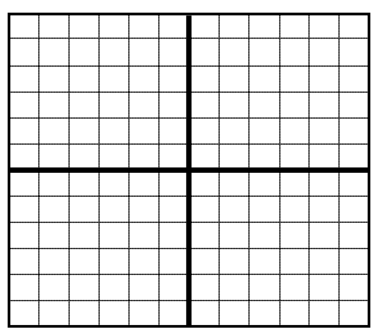


Vertices:

Foci:

Asymptotes:

4) $\frac{(y-2)^2}{4}-\frac{(x+3)^2}{9}=1$

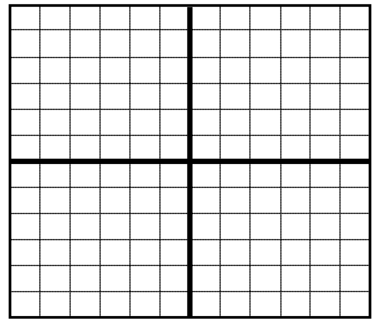


Vertices:

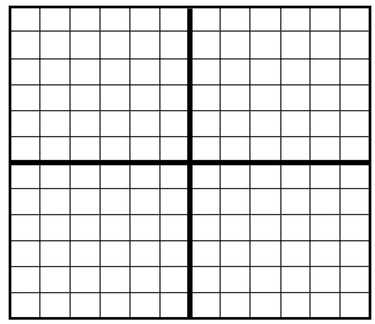
Foci:

Asymptotes:

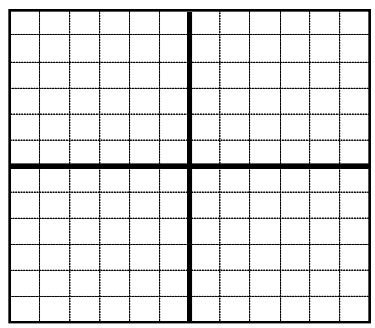
5) **Write an equation of the hyperbola with foci at (0, ±5) and vertices at (0, ±3).**



6) **Write an equation of the hyperbola with foci at** $\left(3 \pm \sqrt{10}, 3\right)$ **and vertices at (4,3) and (2,3).**



7) **Write an equation of the hyperbola with foci at (4,5) and (4,-3) and vertices at (4,4) and (4,-2).**



8) **Write the equation in standard form.**

$$4x^2 - y^2 - 16x - 4y - 4 = 0$$

9) **Write the equation in standard form.**

$$-9x^2 + 16y^2 + 54x + 64y - 161 = 0$$