*AAT

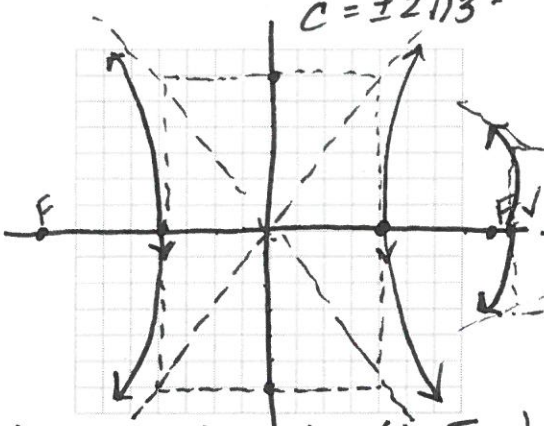
Name: Key

Chapter 11: Hyperbolas (IC)

Date: ____ Period: ____

Graph each hyperbola and calculate the coordinates of the vertices, co-vertices and foci and the equations for the asymptotes.

1. $\frac{x^2}{16} - \frac{y^2}{36} = 1$ $c^2 = a^2 + b^2$ $= 16 + 36$ $c^2 = 52$ $c = \pm 2\sqrt{13} \approx 7.21$

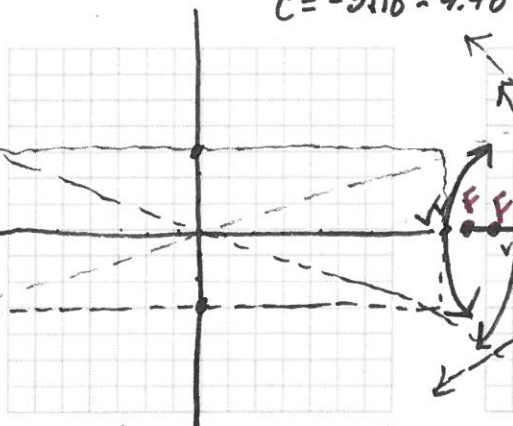


$V(\pm 4, 0)$; $CV(0, \pm 6)$; $F(\pm 2\sqrt{13}, 0)$

asy: $y = \pm \frac{3}{2}x$

T(axis): $y = 0$; C(axis): $x = 0$

2. $\frac{x^2}{81} - \frac{y^2}{9} = 1$ $c^2 = a^2 + b^2$ $= 81 + 9$ $= 90$ $c = \pm 3\sqrt{10} \approx 9.48$



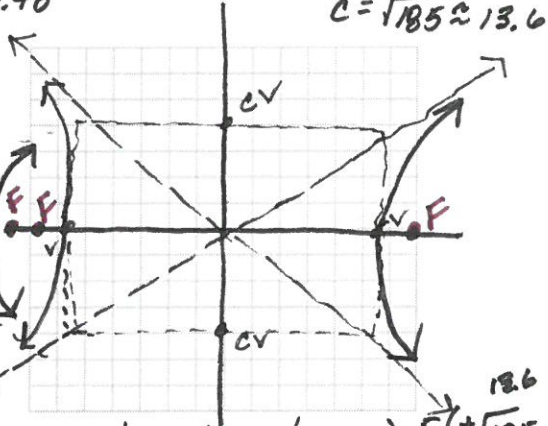
$V(\pm 9, 0)$ $CV(0, \pm 3)$

$F(\pm 3\sqrt{10}, 0)$; asy: $y = \pm \frac{1}{3}x$

9.48

T(axis): $y = 0$; C(axis): $x = 0$

3. $\frac{x^2}{121} - \frac{y^2}{64} = 1$ $c^2 = a^2 + b^2$ $= 121 + 64$ $= 185$ $c = \sqrt{185} \approx 13.6$



13.6

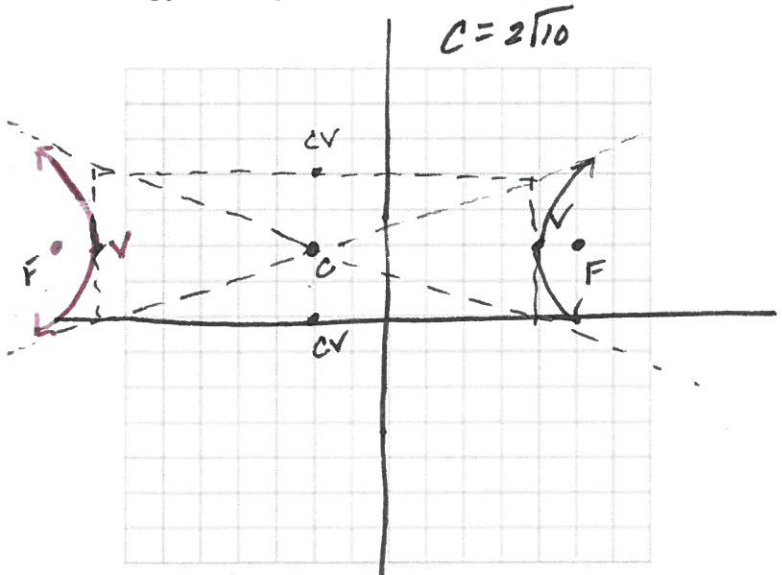
$V(\pm 11, 0)$; $CV(0, \pm 8)$; $F(\pm\sqrt{185}, 0)$

Asy: $y = \pm \frac{8}{11}x$

T(axis): $y = 0$; C(axis): $x = 0$

Identify the coordinates of the center, foci, vertices, and co-vertices and identify equations for the asymptotes and transverse and conjugate axes for each hyperbola. Then sketch a graph of each hyperbola.

4. $\frac{(x+2)^2}{36} - \frac{(y-2)^2}{4} = 1$ $c^2 = a^2 + b^2$ $c^2 = 40$ $c = 2\sqrt{10}$



$C(-2, 2)$; $V(-8, 2)$ & $(4, 2)$

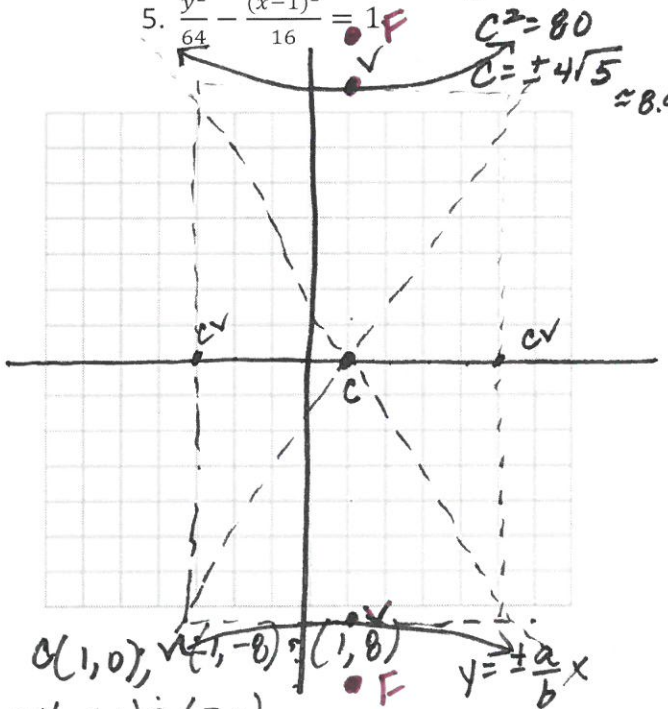
$CV(-2, 0)$ & $(-2, 4)$

$F((-2 \pm 2\sqrt{10}), 2)$ $(-8.32, 2)$ $(4.32, 2)$

Asy: $y = \pm \frac{1}{3}x$; $y = \pm \frac{b}{a}x$

T(axis): $y = 2$; C(axis): $x = -2$

5. $\frac{y^2}{64} - \frac{(x-1)^2}{16} = 1$ $c^2 = a^2 + b^2$ $c^2 = 64 + 16$ $c^2 = 80$ $c = \pm 4\sqrt{5} \approx 8.94$



$C(1, 0)$, $V(1, -8)$ & $(1, 8)$ $y = \pm \frac{a}{b}x$

$CV(-3, 0)$ & $(5, 0)$

$F(1, \pm\sqrt{80})$; Asy: $y = \pm 2x$

8.94

T(axis): $x = 1$

C(axis): $y = 0$

Write an algebraic equation for each hyperbola defined by the given information. Then sketch a graph of each hyperbola.

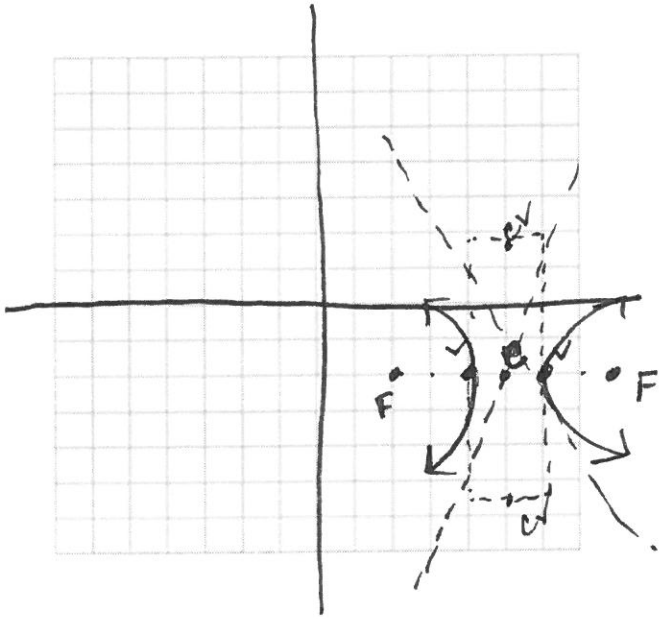
6. Vertices at (4, -2) and (6, -2); Foci at (2, -2) and (8, -2)

$c = a^2 + b^2$

$9 = 1 + b^2$

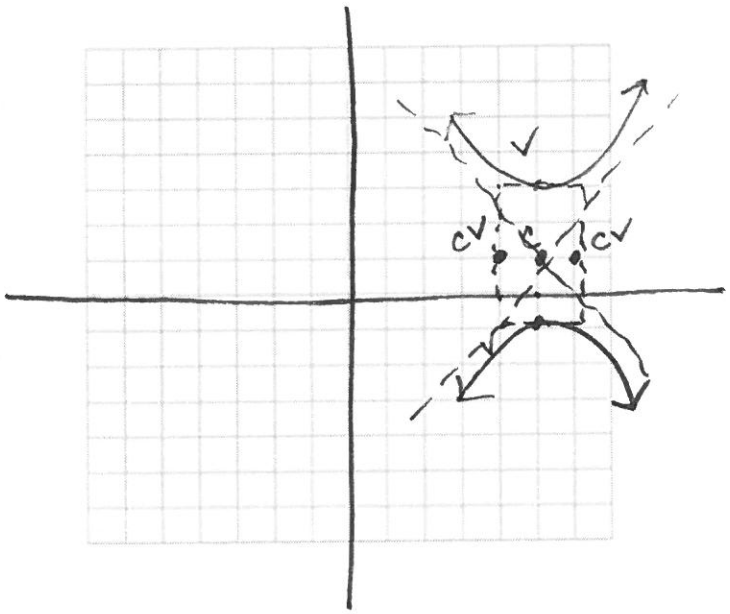
$8 = b^2$

$$\frac{(x-5)^2}{1} - \frac{(y+2)^2}{8} = 1$$



7. Vertices at (5, -1) and (5,3); Co-vertices at (4, 1) and (6, 1)

$$\frac{(y-1)^2}{4} - \frac{(x-5)^2}{1} = 1$$



$C(5, 1)$

$a = 2$

$b = 1$