

① Given Foci $(\pm 3, 0)$
 vertices $(\pm 2, 0)$
 center $(0, 0)$
 Find the eq. of the hyperbola.

major (x) $a=2$ $c=3$

$$c^2 = a^2 + b^2$$

$$3^2 = 2^2 + b^2$$

$$9 = 4 + b^2$$

$$5 = b^2$$

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$

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

② Foci $(0, \pm 6)$
 vertices $(0, \pm 1)$
 center $(0, 0)$
 hyperbola

major (y)

$$a=1 \quad c=6$$

$$6^2 = 1^2 + b^2$$

$$36 = 1 + b^2$$

$$35 = b^2$$

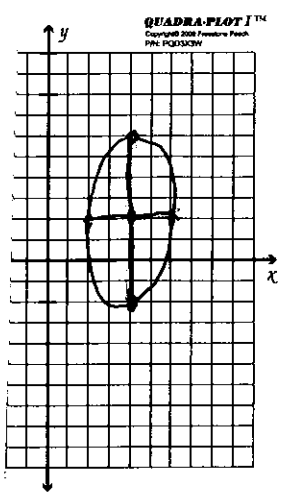
$$\frac{y^2}{1} - \frac{x^2}{35} = 1$$

③ vertices $(4, 6)$ $(4, -2)$ center

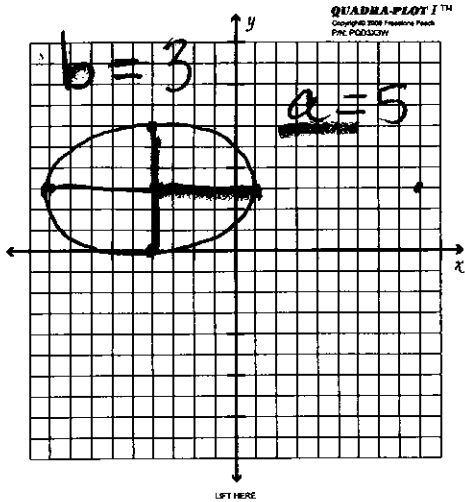
co-vertices $(6, 2)$ $(2, 2)$
 Ellipse

center $(4, 2)$ (4)
 $a=4$ $b=2$

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



- ④ vertices $(1, 3)$ $(-9, 3)$
 co-vertices: $(-4, 6)$ $(-4, 0)$



center $(-4, 3)$

$$\frac{(x+4)^2}{25} + \frac{(y-3)^2}{9} = 1$$

p. 589 (9) Find the Points of Intersection

⑨ $4x^2 + 25y^2 = 100$
 $y = x + 2$

$$4x^2 + 25(x+2)^2 = 100$$

$$4x^2 + 25(x+2)(x+2) = 100$$

$$4x^2 + 25(x^2 + 2x + 2x + 4) = 100$$

$$4x^2 + 25(x^2 + 4x + 4) = 100$$

$$4x^2 + 25x^2 + 100x + 100 = 100$$

$$29x^2 + 100x = 0$$

$$x(29x + 100) = 0$$

ellipse
line

$(0, 2)$
 $(-\frac{100}{29}, \frac{-42}{29})$

$x = 0$ $y = 0 + 2 = 2$

$29x + 100 = 0$
 $-100 - 100$

$\frac{29x}{29} = \frac{-100}{29}$

$x = \frac{-100}{29}$

$y = \frac{-100}{29} + 2$