

Pre-Calculus Honors
Objective 3.2: Graphing and Creating Conics

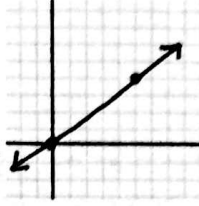
Do Now:

1. What is the equation for the line graphed at right?

$$y = \frac{4}{5}x$$

2. If I wanted to transform the line $y = 1/2x$ up 5 and right 4, what could the new equation of the line be?

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



ACT: In the standard (x, y) coordinate plane, what is the center of a circle with the equation $(x - 2)^2 + (y + 1)^2 = 4$?

- A. $(-2, 1)$
- B. $(-2, 4)$
- C. $(2, -1)$**
- D. $(4, -2)$
- E. $(-2, 2)$

3. What do $a, b, h,$ and k tell you about the conic section below? How do they transform the circle?

h & k - horizontal & vertical shift & tell you center
Hyperbolas:

$$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$$

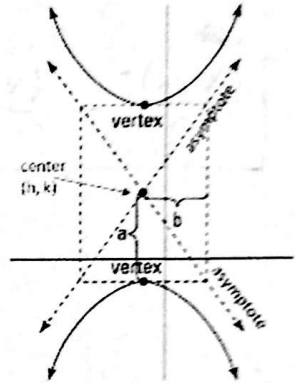
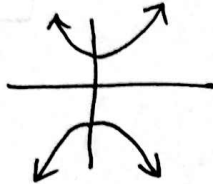
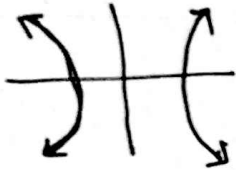
a & b - semi-major & minor axes & tell how much to stretch

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

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

a = semitransverse axis

b = semiconjugate axis



Find vertices, semitransverse and semiconjugate axes, and asymptotes:

1. $4y^2 - 9x^2 = 36$ \rightarrow \div by 36

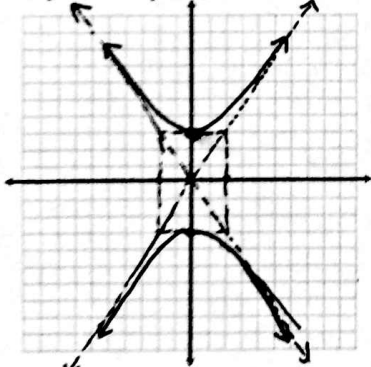
$$\frac{y^2}{9} - \frac{x^2}{4} = 1$$

vertices: $(0, 3)$ & $(0, -3)$

semi-trans: 3

semi-conj: 2

asympt: $y = \frac{3}{2}x$ & $y = -\frac{3}{2}x$



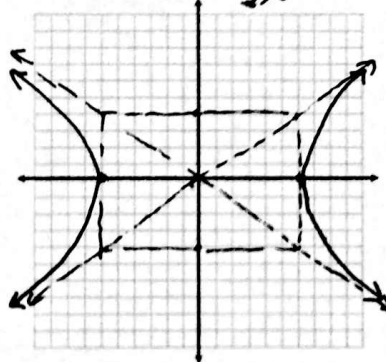
2. $\frac{x^2}{36} - \frac{y^2}{16} = 1$

vertices: $(6, 0)$ & $(-6, 0)$

semi-trans: 6

semi-conj: 4

asympt: $y = \frac{2}{3}x$
 $y = -\frac{2}{3}x$



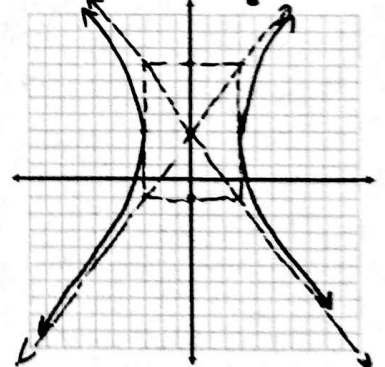
3. $\frac{x^2}{9} - \frac{(y-3)^2}{16} = 1$

vertices: $(3, 3)$ & $(-3, 3)$

semi-trans: 3

semi-conj: 4

asympt: $y = \frac{4}{3}x + 3$
 $y = -\frac{4}{3}x + 3$



4. $-36x^2 - 72x + 16y^2 - 64y - 548 = 0$

$$(-36x^2 - 72x) + (16y^2 - 64y) = 548$$

$$-36(x^2 + 2x) + 16(y^2 - 4y) = 548$$

$$-36(x^2 + 2x + 1) + 16(y^2 - 4y + 4) = 548 - 36 + 64$$

$$-36(x+1)^2 + 16(y-2)^2 = 576$$

$$-\frac{(x+1)^2}{16} + \frac{(y-2)^2}{36} = 1$$

$$\frac{(y-2)^2}{36} - \frac{(x+1)^2}{16} = 1$$

center: $(-1, 2)$

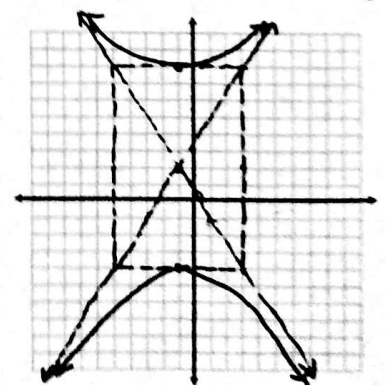
vertices: $(-1, 8)$ & $(-1, -4)$

semi-trans: 6

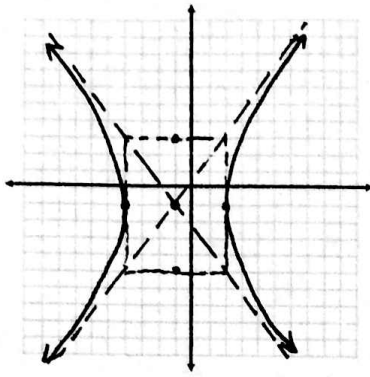
semi-conj: 4

asympt: $y = \frac{3}{2}(x+1) + 2$

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

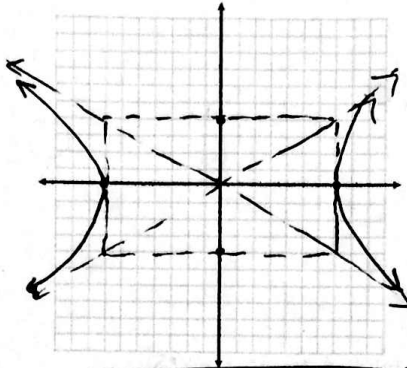


5. Find the equation of the hyperbola below:



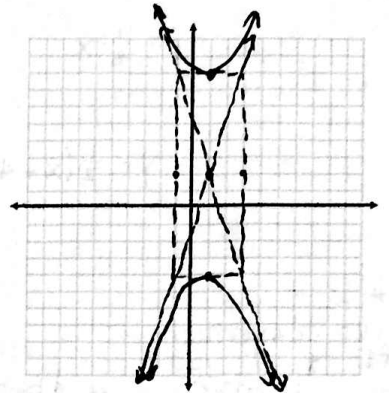
$$\frac{(x+1)^2}{9} - \frac{(y+1)^2}{16} = 1$$

6. Write an equation for the hyperbola with vertices (7, 0) and (-7, 0) and conjugate axis of length 8



$$\frac{x^2}{49} - \frac{y^2}{16} = 1$$

7. Find the equation for the hyperbola with vertices (1, -4) and (1, 8), conjugate axis length 4



$$\frac{(y-2)^2}{36} - \frac{(x-1)^2}{4} = 1$$

Work Space:

