

Unit 7 Review #2 - Conics

1. Graph each of the following equations.

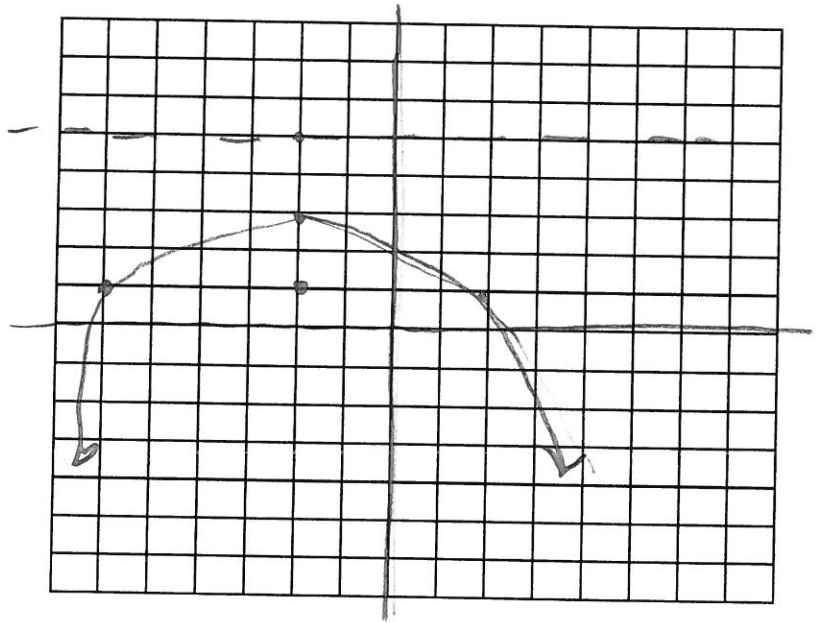
a. $(x+2)^2 = -8(y-3)$

Vertex: $(-2, 3)$

Opens: down

Focus: $(-2, 1)$

Focal Width: 8

Equation of Directrix: $y=5$ 

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

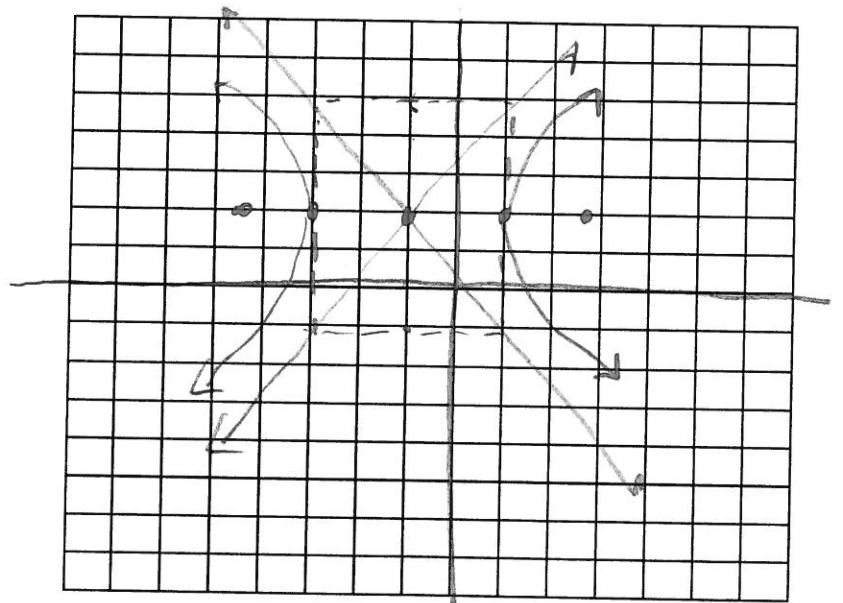
Center: $(-1, 2)$

Transverse Axis: 4

Conjugate Axis: 6

Calculate c:

$$c = \sqrt{13} = 3.6$$

Slopes of Asymptotes: $\pm \frac{3}{2}$ Vertices: $(-3, 2)$ $(1, 2)$ Covertices: $(-1, 5)$ $(-1, -1)$ Foci: $(2.6, 2)$ $(-4.6, 2)$ 

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

Orientation: horizontal

Center: $(3, -2)$

Major Axis Length: 8

Minor Axis Length: 4

Calculate c:

$$c^2 = 16 - 4$$

$$c = \sqrt{12} = 3.5$$

Vertices:

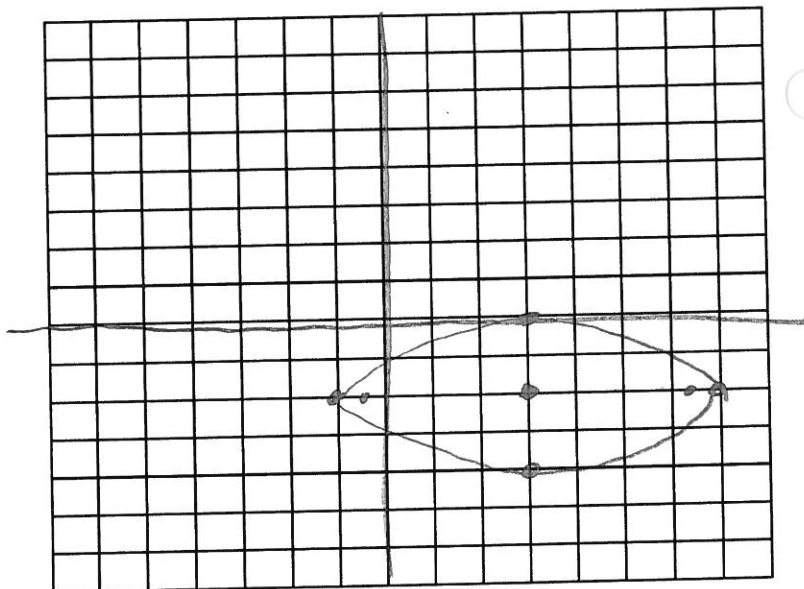
$(-1, -2)$ $(7, -2)$

Covertices:

$(3, 0)$ $(3, -4)$

Foci:

$(-0.5, -2)$ $(6.5, -2)$



$$d. x^2 + 4x + y^2 - 6y - 3 = 0$$

Complete the Square!

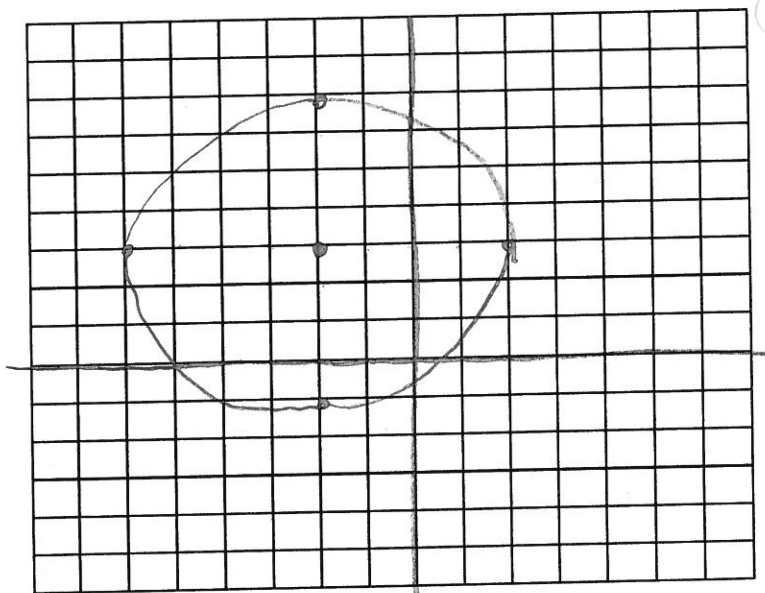
$$x^2 + 4x + 4 + y^2 - 6y + 9 = 3 + 4 + 9$$

$$(x+2)(x+2) + (y-3)(y-3) = 16$$

$$(x+2)^2 + (y-3)^2 = 16$$

Center: $(-2, 3)$

Radius: 4



e. $x^2 + 2x + y^2 - 8y + 1 = 0$

Complete the Square!

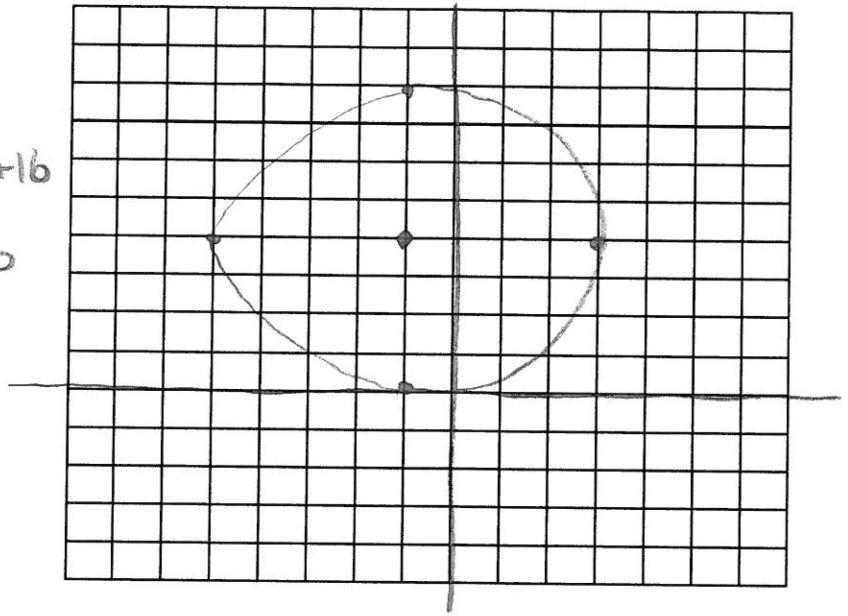
$$x^2 + 2x + 1 + y^2 - 8y + 16 = -1 + 1 + 16$$

$$(x+1)(x+1) + (y-4)(y-4) = 16$$

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

Center: $(-1, 4)$

Radius: 4



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

Center: $(1, -1)$

Transverse Axis: 4

Conjugate Axis: 10

Calculate c:

$$c = \sqrt{29} = 5.4$$

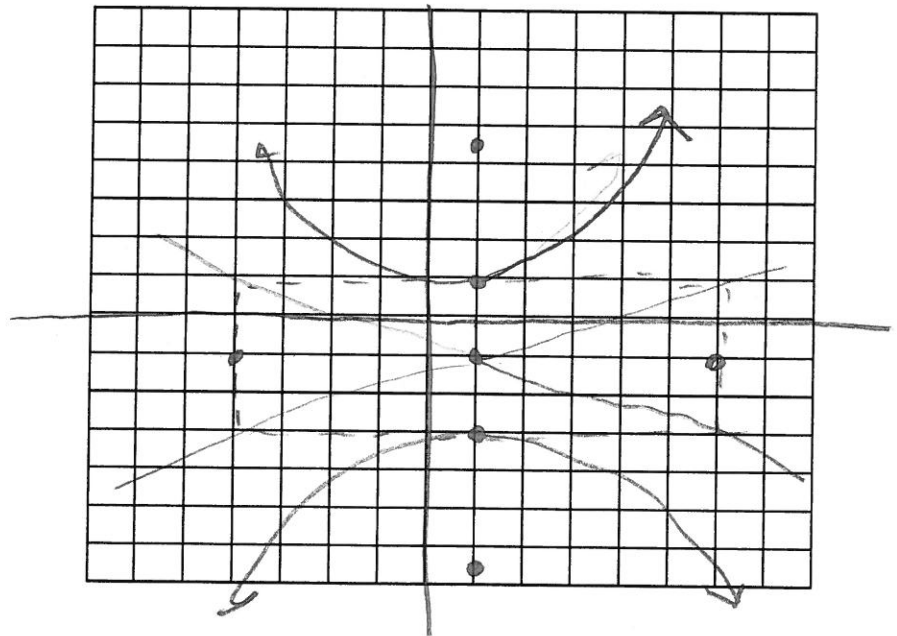
Slopes of Asymptotes:

$$\pm \frac{2}{5}$$

Vertices: $(1, 1)$ $(1, -3)$

Covertices: $(-4, -1)$ $(6, -1)$

Foci: $(1, 4.4)$ $(1, -6.4)$



2. Write the equation for the following circle described.

a. Center is $(-2, 5)$ and radius is $\sqrt{3}$.

$$(x+2)^2 + (y-5)^2 = 3$$

b. Center at $(0, 0)$ and passes through $(-3, 8)$.

$$x^2 + y^2 = 73$$

c. The points $(0, -6)$ and $(4, 8)$ are endpoints of the diameter.

$$(x-2)^2 + (y-1)^2 = 53$$

3. Write the equation for an ellipse with vertices $(2, 4)$ and $(2, -6)$ and minor axis length of 4.

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

4. Write the equation for a hyperbola with transverse axis length of 14 and covertices $(-1, 2)$ and $(-1, 14)$.

$$\frac{(x+1)^2}{49} - \frac{(y-8)^2}{36} = 1$$

5. Write the equation for the parabola with vertex $(-4, -9)$ and focus $(-8, -9)$.

$$(y+9)^2 = -16(x+4)$$