

Chapter 11 Review

I) Identify the Following Conics.

- a) $x^2 + y^2 - 10x - 2y + 10 = 0$ circle
- b) $9x^2 + 25y^2 - 36x - 50y + 61 = 0$ ellipse
- c) $x^2 - 2x + 8y + 17 = 0$ parabola
- d) $36x^2 + 9y^2 + 48x - 36y + 43 = 0$ ellipse
- e) $3x^2 - y^2 - 12x - 2y + 5 = 0$ hyperbola

II) Write an equation of the specified conic.

- a) circle
center (0,0)
radius: 9

$$\underline{x^2 + y^2 = 81}$$

- b) circle
center (8,-1)
radius: 2

$$\underline{(x-8)^2 + (y+1)^2 = 4}$$

- c) Parabola
vertex (5,3)
focus (5,2)

$$\underline{y = -\frac{1}{4}(x-5)^2 + 3}$$

- d) Ellipse
center (0,0)
a=7
covertices ($\pm 4, 0$)

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

- e) hyperbola
center (-4,5)
major axis: y
a = ± 5
b = ± 3

$$\underline{\frac{(y-5)^2}{25} - \frac{(x+4)^2}{9} = 1}$$

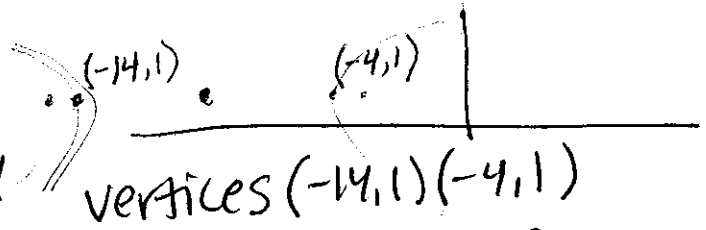
III) Write in standard form and identify the conic.

- a) $y^2 + 6y + 2x + 9 = 0$ $x = -\frac{1}{2}(y+3)^2$ parabola
- b) $x^2 + y^2 + 8x - 2y + 13 = 0$ $(x+4)^2 + (y-1)^2 = 4$ circle
- c) $3x^2 - y^2 - 12x - 4y - 1 = 0$ $\frac{(x-2)^2}{3} - \frac{(y+2)^2}{9} = 1$ hyperbola
- d) $4x^2 + y^2 - 16x + 2y + 1 = 0$ $\frac{(x-2)^2}{4} + \frac{(y+1)^2}{16} = 1$ ellipse

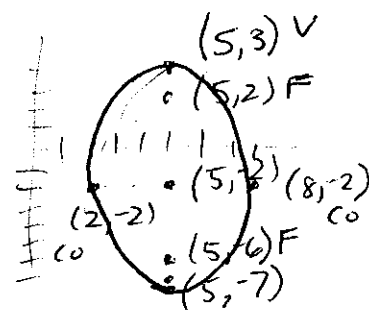
IV. Graph and give all pertinent info.

a) $(x-3)^2 + (y+7)^2 = 36$
 center $(3, -7)$
 $R = 6$

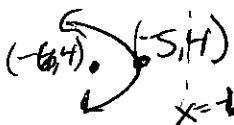
b) $\frac{(x+9)^2}{25} - \frac{(y-1)^2}{4} = 1$
 center $(-9, 1)$ asymptotes: $y = \pm \frac{2}{5}x$
 $a = 5$ $b = 2$ Foci: $c = \sqrt{29}$
 $(-9 \pm \sqrt{29}, 1)$



c) $\frac{(x-5)^2}{9} + \frac{(y+2)^2}{25} = 1$
 vertices $(5, 3)$ $(5, -7)$ center $(5, -2)$ Foci $(5, 2)$ $(5, -6)$
 $a = 5$ $b = 3$ $c = 4$



d) $x = -\frac{1}{4}(y-4)^2 - 5$
 vertex: $(-5, 4)$
 $p = -1$ directrix $x = -4$
 Focus: $(-6, 4)$ axis $y = 4$



V. Find the points of Intersection.

a) $\begin{cases} x^2 = 4y \\ x - y = -2 \\ x - x^2 = -2 \\ x^2 - x - 2 = 0 \\ (x-2)(x+1) = 0 \end{cases}$

$x = 2$ $x = -1$
 $y = 4$ $y = 1$
 $(2, 4)$ $(-1, 1)$

b) $\begin{cases} x^2 + y^2 = 100 \\ x + y = 14 \\ y = -x + 14 \end{cases}$

$(x^2) + (-x+14)^2 = 100$
 $x^2 + x^2 - 28x + 196 = 100$
 $2x^2 - 28x + 96 = 0$
 $2(x^2 - 14x + 48) = 0$
 $2(x-8)(x-6) = 0$
 $x = 8$ $x = 6$
 $y = 6$ $y = 8$

$(8, 6)$
 $(6, 8)$