

Show all work for full credit. It might help to make a quick sketch of the conic.

1. Identify the type of conic and then find the relevant things for each type of conic (center, focus, directrix, vertex, co-vertex, asymptotes, etc.)

a)  $(x-5)^2 + (y+1)^2 = 25$

b)  $\frac{\left(y-\frac{3}{2}\right)^2}{\frac{49}{4}} + \frac{(x+2)^2}{16} = 1$

c)  $-\frac{9(x-7)^2}{8} + \frac{25(y+2)^2}{32} = 2$

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

2. Put the following in standard form, identify the type of conic and then find the relevant things for each type of conic (center, focus, directrix, vertex, co-vertex, asymptotes, etc.)

a)  $x^2 - 8x + 10y + y^2 - 8 = 0$

b)  $y^2 + 4x - 2y = 11$

c)  $2x^2 + 18y + 20x + 3y^2 + 5 = 0$

d)  $-16x^2 - 36y - 128x + 9y^2 - 364 = 0$

e)  $y^2 - 8x - 4y + 18 = -22$

f)  $9x^2 + 4y^2 + 18x - 16y = 0$

g)  $x^2 + 2x - 2y^2 + 4y = 17$

h)  $3x^2 - 36y + 24x + 3y^2 = -135$

3. Find the equation, in standard form, of the circle that contains the point  $(-3,5)$  and has its center at  $(-2,1)$ .
4. Write the equation, in standard form, of the parabola with a focus at  $(-2,3)$  and a directrix at  $x = 6$ .
5. Write the equation, in standard form, for the hyperbola that has a vertices at  $(-2,2)$  and  $(8,2)$  a focus at  $(10,2)$ .
6. Write the equation, in standard form, of the ellipse with vertices at  $(-1,7)$  and  $(-1,-13)$  and a co-vertex at  $(4,-3)$ .
7. Write the equation, in standard form, of the conic with co-vertices at  $(1,9)$  and  $(1,3)$  and a focus at  $(-6,6)$ .
8. Write the equation of the hyperbola that has a horizontal transverse axis and asymptotes of  $y = 2x + 8$  and  $y = -2x - 4$ .
9. Find the point(s) of intersection, if any, of the graphs in the system.
- a)  $x^2 + y^2 = 20$   
 $x - y = -2$
- b)  $4x^2 + y^2 = 16$   
 $y = x - 2$
- c)  $9x^2 + y^2 - 90x = -216$   
 $x^2 - y^2 - 16 = 0$