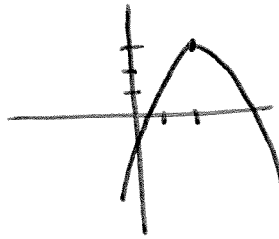


## 10 Conic Sections

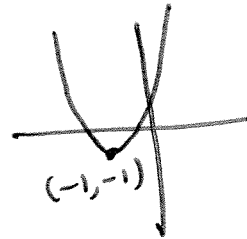
Sketch the graph of the parabola.

1.  $y = -(x - 2)^2 + 3$       vertex  $(2, 3)$



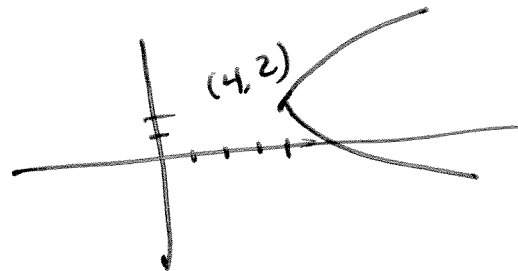
2.  $y = 3(x + 1)^2 - 1$

vertex  $(-1, -1)$



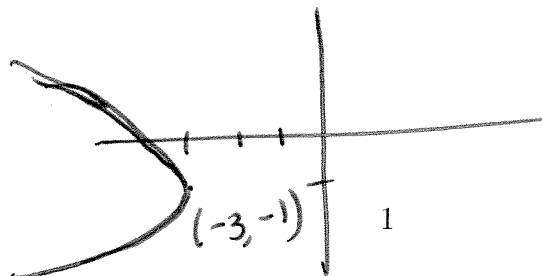
3.  $x - 4 = 2(y - 2)^2$

vertex  $(4, 2)$



4.  $x = -(y + 1)^2 - 3$

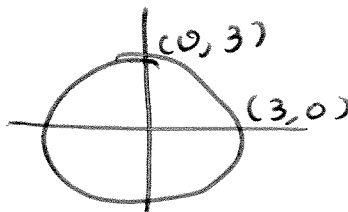
$(x + 3) = -(y + 1)^2$       vertex  $(-3, -1)$



Write the equation of each circle. Sketch the graph.

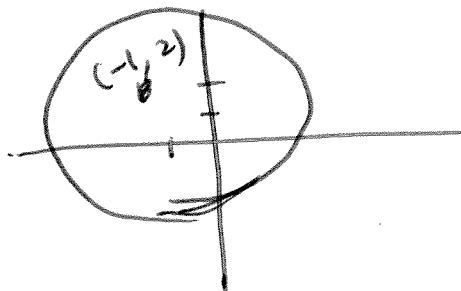
5. Center  $(0,0)$  and radius 3

$$x^2 + y^2 = 3^2$$



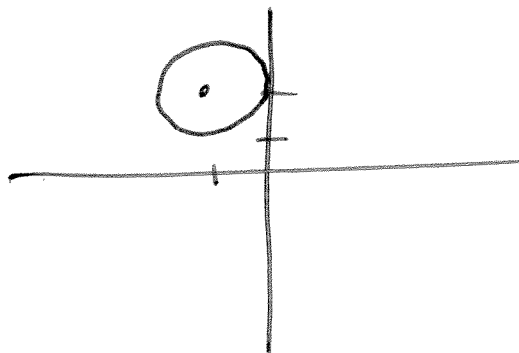
6. Center  $(-1,2)$  and radius 2

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



7. Center  $(-1,2)$  and radius 1

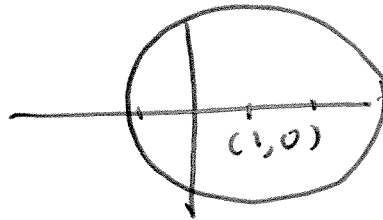
$$(x+1)^2 + (y-2)^2 = 1$$



State the center and radius of each circle. Sketch the graph.

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

$(1, 0), r = 2$



9.  $(x + 1)^2 + (y - 1)^2 = 9$

$(-1, 1), r = 3$



For each equation of a circle, write in the standard equation form  $(x - h)^2 + (y - k)^2 = r^2$ . State the center and radius of each circle. Sketch the graph.

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

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

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

center  $(-2, 3), r = 4$

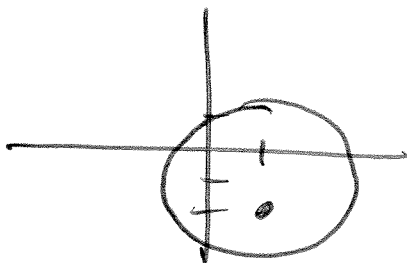


11.  $x^2 - 2x + y^2 + 4y = 4$

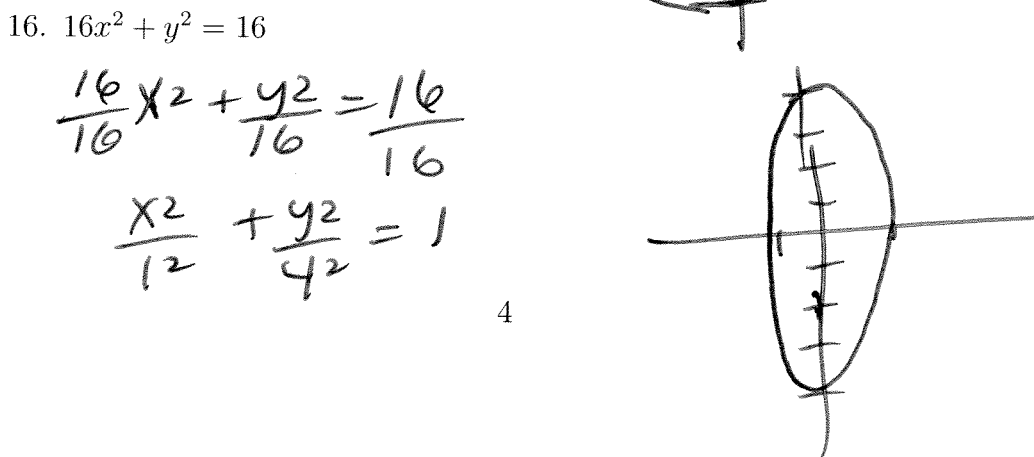
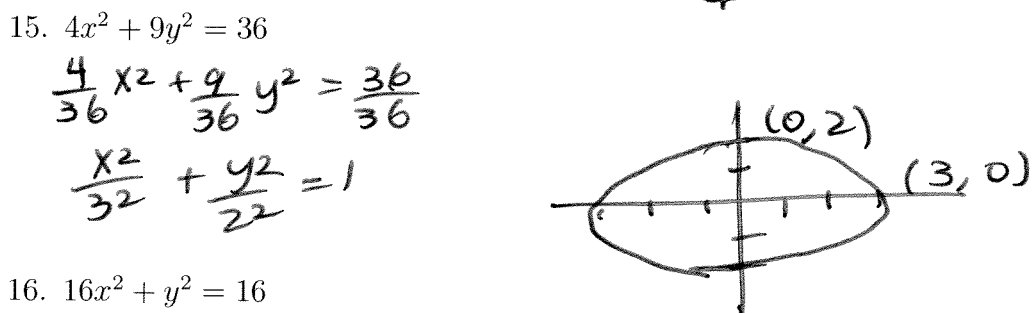
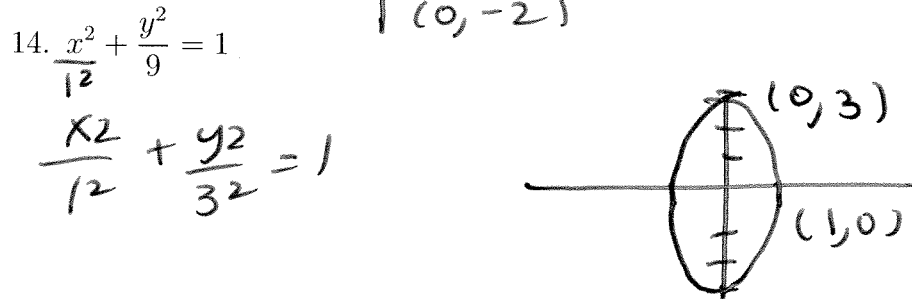
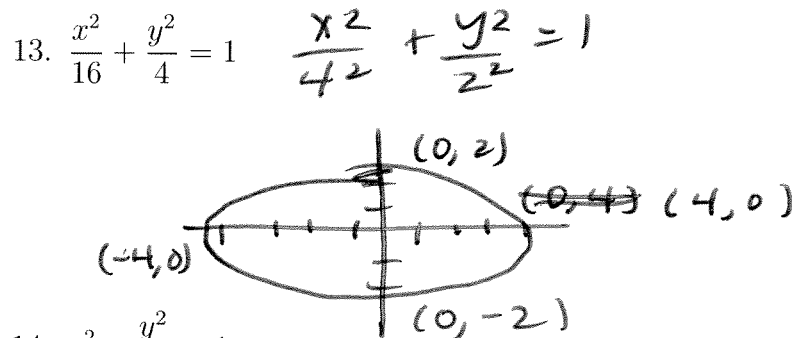
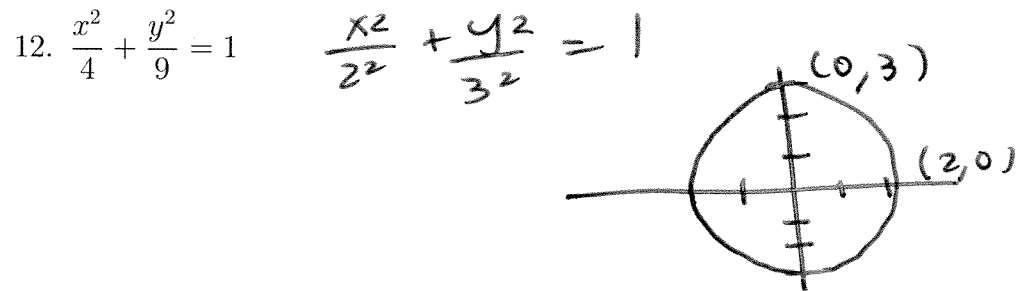
$(x^2 - 2x + 1) + (y^2 + 4y + 4) = 1 + 4 + 4$

$(x - 1)^2 + (y + 2)^2 = 9$

center  $(1, -2), r = 3$

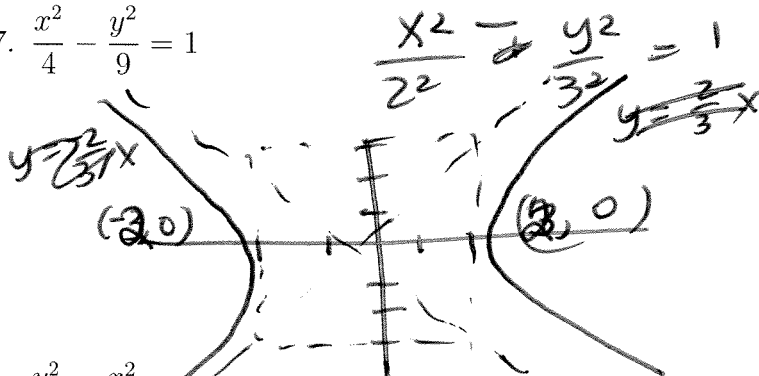


Sketch the graph of each ellipse. Label the  $x$ - and  $y$ -intercepts.



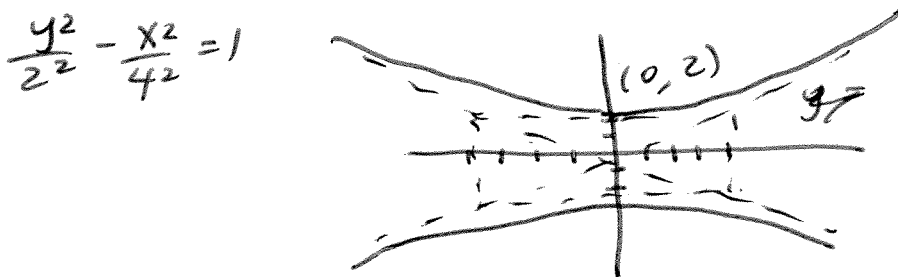
Sketch the graph of each hyperbola. Label the intercepts. Sketch the asymptotes and give the equations for the asymptotes.

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



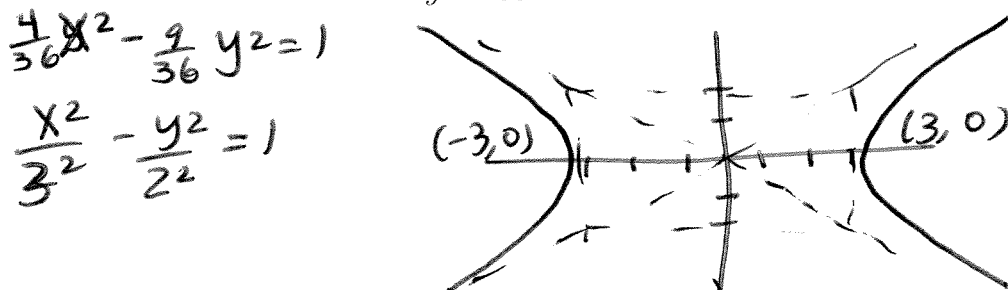
Asymptote  $y = \pm \frac{3}{2}x$

18.  $\frac{y^2}{4} - \frac{x^2}{16} = 1$



Asymptote:  
 ~~$y = \pm 2x$~~   
 $y = \pm \frac{1}{2}x$

19.  $4x^2 - 9y^2 = 36$



Asymptote:  
 $y = \pm \frac{2}{3}x$

20.  $y^2 - 16x^2 = 16$

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

Asymptote  
 $y = \pm 4x$

