Math Analysis Honors - Conic Sections Review

Use the information provided to write the standard form equation of each circle.

1) Center: $(2, -13)$
Point on Circle: $(3, -18)$

Use the information provided to write the standard form equation of each ellipse.

2) Vertices: $(19, 5), (1, 5)$
Foci: $(10 + \sqrt{65}, 5), (10 - \sqrt{65}, 5)$

3) Endpoints of major axis: $(13, 3), (-9, 3)$
Endpoints of minor axis: $(2, 9), (2, -3)$

4) Minor axis is vertical
Center: $(-7, 8)$
Major axis is 20 units long
Minor axis is 18 units long

Use the information provided to write the standard form equation of each hyperbola.

5) Vertices: $(-5, -7), (-15, -7)$
Foci: $(3, -7), (-23, -7)$

6) Foci: $(13, -3), (-13, -3)$
Asymptotes: $y = \frac{12}{5}x - 3$
$y = -\frac{12}{5}x - 3$

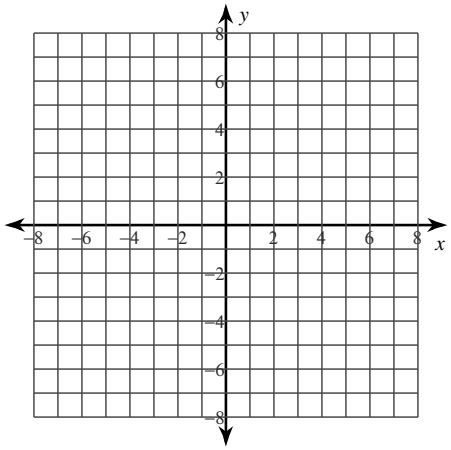
Use the information provided to write the vertex form equation of each parabola.

7) Vertex: $(10, -8)$, Focus: $\left(\frac{41}{4}, -8\right)$

8) Vertex: $(-4, -1)$, Directrix: $x = -\frac{17}{4}$

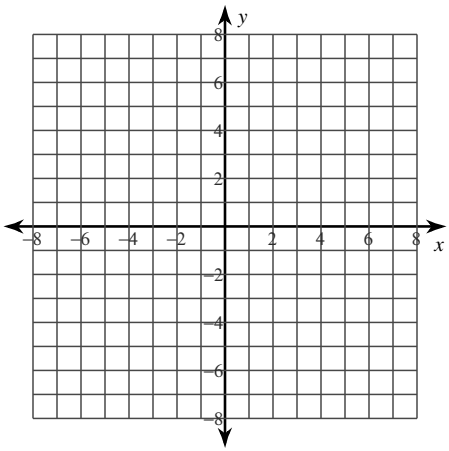
Identify the center and radius of each. Then sketch the graph.

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



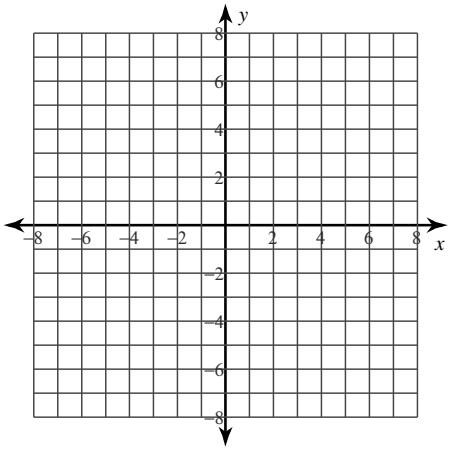
Identify the vertices and foci of each. Then sketch the graph.

10) $\frac{(x+2)^2}{16}+(y+3)^2=1$



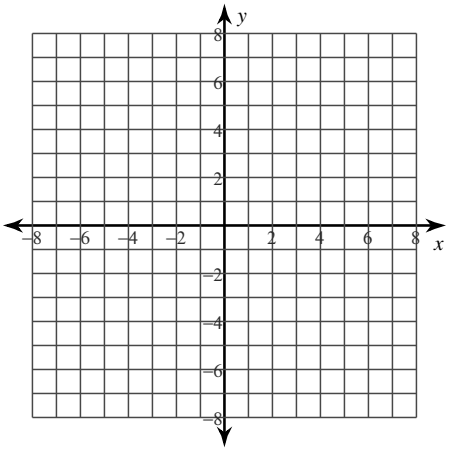
Identify the vertices, foci, and asymptotes of each. Then sketch the graph.

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



Identify the vertex, focus, axis of symmetry, and directrix of each. Then sketch the graph.

12) $-2(y+5)=(x+6)^2$



Classify each conic section and write its equation in standard form.

13) $x^2+y^2+4x+8y+16=0$

14) $x^2+y^2-8y+8=0$

15) $-2x^2-8x+y-3=0$

16) $3x^2+2y^2-6x-87=0$

17) $-3x^2+18x+y-22=0$

18) $x^2-9y^2+4x-54y-86=0$

Answers to

1) $(x-2)^2+(y+13)^2=26$

2) $\frac{(x-10)^2}{81}+\frac{(y-5)^2}{16}=1$

3) $\frac{(x-2)^2}{121}+\frac{(y-3)^2}{36}=1$

4) $\frac{(x+7)^2}{100}+\frac{(y-8)^2}{81}=1$

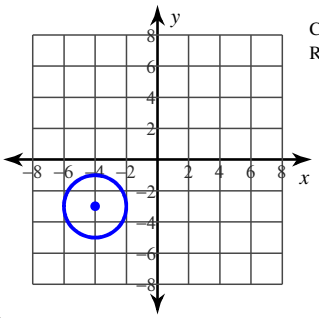
5) $\frac{(x+10)^2}{25}-\frac{(y+7)^2}{144}=1$

6) $\frac{x^2}{25}-\frac{(y+3)^2}{144}=1$

7) $x=(y+8)^2+10$

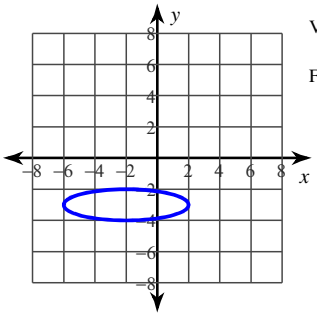
8) $x=(y+1)^2-4$

9)



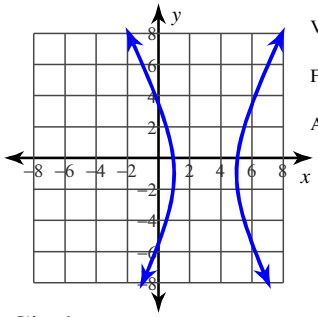
Center: $(-4,-3)$
Radius: 2

10)



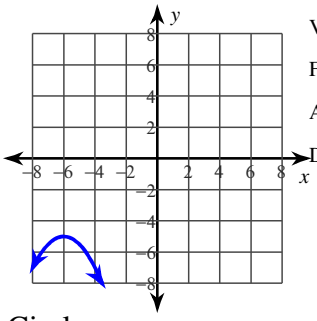
Vertices: $(2,-3)$, $(-6,-3)$
Foci: $(-2+\sqrt{15},-3)$, $(-2-\sqrt{15},-3)$

11)



Vertices: $(5,-1)$, $(1,-1)$
Foci: $(3+2\sqrt{5},-1)$, $(3-2\sqrt{5},-1)$
Asym.: $y=2x-7$, $y=-2x+5$

12)



Vertex: $(-6,-5)$
Focus: $\left(-6,-\frac{11}{2}\right)$
Axis of Sym.: $x=-6$
Directrix: $y=-\frac{9}{2}$

13) Circle

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

14) Circle

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

15) Parabola

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

16) Ellipse

$\frac{(x-1)^2}{30}+\frac{y^2}{45}=1$

17) Parabola

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

18) Hyperbola

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