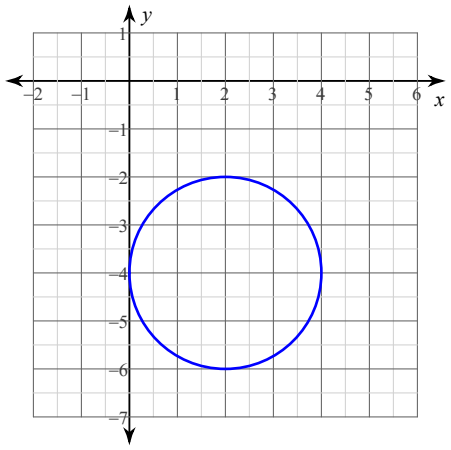
Use the information provided to write the standard form equation of each circle.

1)



2) Ends of a diameter: $(12, -13)$ and $(12, -9)$

3) Center: $(-16, -12)$
Area: 7π

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

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

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

5) Vertices: $(3, -3)$, $(3, -13)$
Foci: $(3, -5)$, $(3, -11)$

6) Endpoints of major axis: $(17, -3)$, $(3, -3)$
Endpoints of minor axis: $(10, 3)$, $(10, -9)$

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

7) Vertices: $(9, 9)$, $(3, 9)$
Foci: $(11, 9)$, $(1, 9)$

8) Vertices: $(-2, 5)$, $(-8, 5)$
Distance from Center to Focus = 5

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

9) Vertex: $(5, 9)$, Focus: $\left(5, \frac{37}{4}\right)$

10) Focus: $(-10, 3)$, Directrix: $x = -8$

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

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

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

12) $-y^2 + 4x + 2y - 13 = 0$

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

13) $x^2 - 4y^2 + 6x - 8y + 1 = 0$

14) $49x^2 + 9y^2 + 392x + 343 = 0$

15) $x^2 + y^2 + 4x - 2y - 18 = 0$

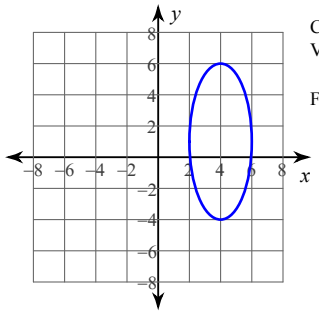
Answers to

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

2) $(x-12)^2+(y+11)^2=4$

3) $(x+16)^2+(y+12)^2=7$

4)



Center: $(4, 1)$
Vertices: $(4, 6)$
$(4, -4)$
Foci: $(4, 1+\sqrt{21})$
$(4, 1-\sqrt{21})$

5) $\dfrac{(x-3)^2}{16}+\dfrac{(y+8)^2}{25}=1$

6) $\dfrac{(x-10)^2}{49}+\dfrac{(y+3)^2}{36}=1$

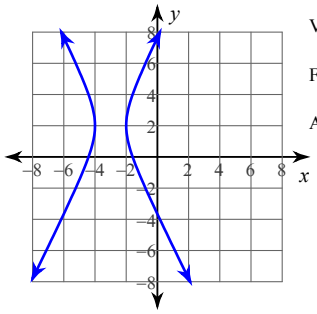
7) $\dfrac{(x-6)^2}{9}-\dfrac{(y-9)^2}{16}=1$

8) $\dfrac{(x+5)^2}{9}-\dfrac{(y-5)^2}{16}=1$

9) $y=(x-5)^2+9$

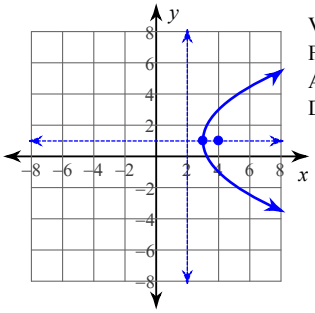
10) $x=-\dfrac{1}{4}(y-3)^2-9$

11)



Vertices: $(-2, 2)$
$(-4, 2)$
Foci: $(-3+\sqrt{5}, 2)$
$(-3-\sqrt{5}, 2)$
Asym.: $y=2x+8$
$y=-2x-4$

12)



Vertex: $(3, 1)$
Focus: $(4, 1)$
Axis of Sym.: $y=1$
Directrix: $x=2$

13) Hyperbola

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

14) Ellipse

$\dfrac{(x+4)^2}{9}+\dfrac{y^2}{49}=1$

15) Circle

$(x+2)^2+(y-1)^2=23$