

For #1-3, find the equation of each circle under the given conditions.

1. center $(3, -5)$; radius 6

1. _____

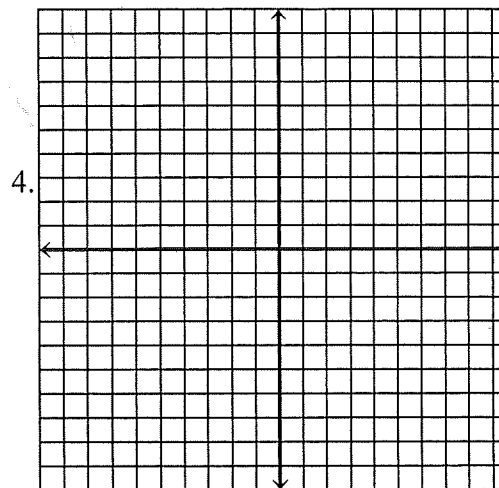
2. center $(-1, 2)$; passing through $(4, -7)$

2. _____

3. diameter endpoints: $(-4, 6)$ and $(10, 2)$

3. _____

4. a. Sketch the circle: $(x-2)^2 + (y+1)^2 = 25$.

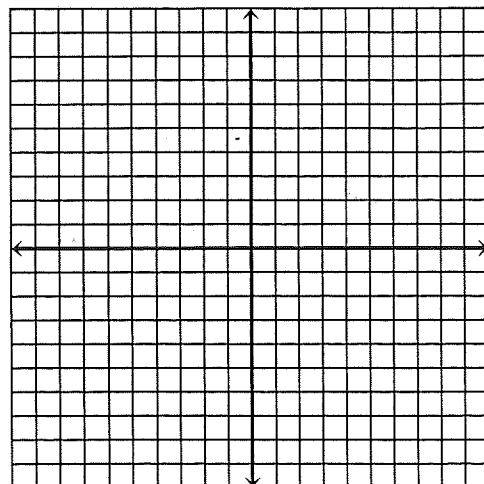


5. Find the center of the circle and radius. Graph it.

$$x^2 - 6x + y^2 - 4y - 5 = 0$$

5. _____

Standard Form



For #6-9, find the equation of each ellipse under the given conditions.

6. foci on the x-axis; x-intercepts ± 7 ,
y-intercepts ± 4 , center $(0,0)$

6. _____

7. foci $(1,2)$ and $(7,2)$; length of major axis 20

7. _____

8. vertices $(2,10)$ and $(2,-10)$; length of minor axis 6

8. _____

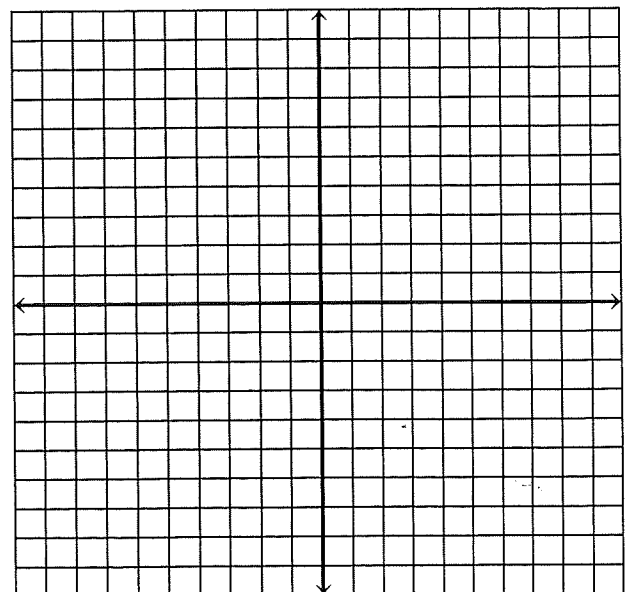
9. vertices $(3,4)$ and $(3,-6)$; foci $(3,2)$ and $(3,-4)$

9. _____

10. Sketch the ellipse:

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

- What is the length of the major axis _____
- What is the length of the minor axis _____
- What is the center _____
- What are the major vertices _____ and _____
- What are the minor vertices _____ and _____
- What are the coordinates of the foci _____ and _____

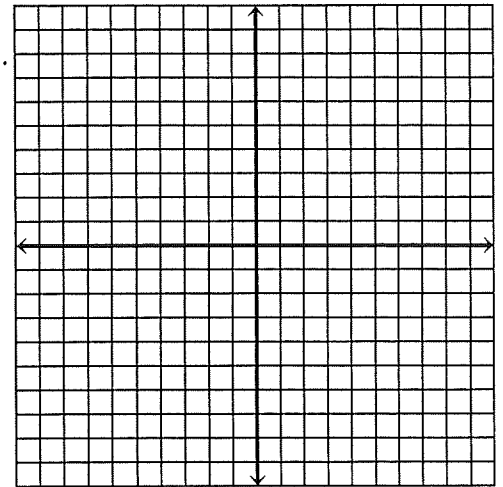


11. What is the length of the latus rectum for problem #10. _____

12. What is the area of the ellipse for #10? _____

13. Sketch the ellipse: $9(x - 3)^2 + 25(y + 1)^2 = 225$.

13.



For #12-17, find the equation of each hyperbola under the given conditions.

14. vertices $(-2, 2)$ and $(2, 2)$; foci $(4, 2)$ and $(-4, 2)$

14. _____

15. Center at $(1, 6)$ Vertical Transverse Axis is 10 and Horizontal conjugate axis is 4.

15. _____

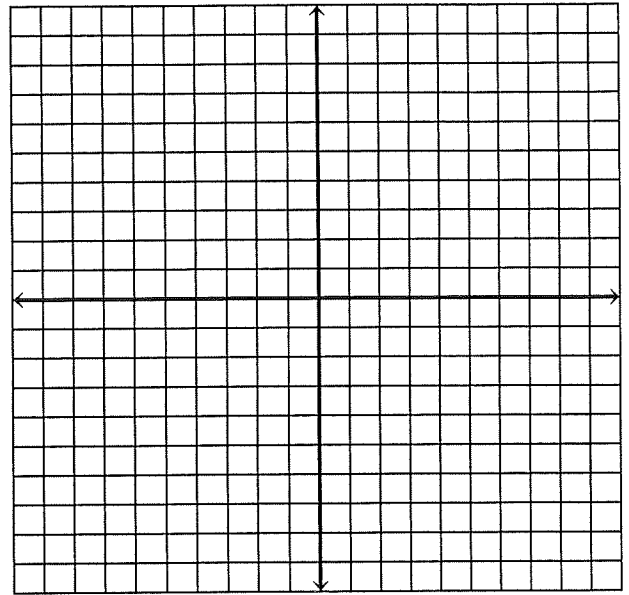
16. Center (4, -2)
 Focus (7, -2)
 Vertex (6, -2)

16. _____

17. Sketch the hyperbola:

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

Use the asymptotes to help sketch the graph.



18. Given the hyperbola : $\frac{x^2}{25} - \frac{y^2}{9} = 1$, what are the equations of the asymptotes? _____

19. Rewrite the equation in standard form $4y^2 - x^2 + 6x - 24y + 11 = 0$

19. _____

For #1-3, find the equation of each circle under the given conditions.

1. center $(3, -5)$; radius 6

$$(x-3)^2 + (y+5)^2 = 36$$

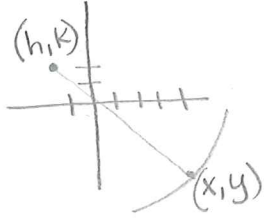
2. center $(-1, 2)$; passing through $(4, -7)$

$$(x-h)^2 + (y-k)^2 = r^2$$

$$(4-(-1))^2 + (-7-2)^2 = r^2$$

$$5^2 + (-9)^2 = r^2$$

$$25 + 81 = r^2$$



$$(x+1)^2 + (y-2)^2 = 106$$

3. diameter endpoints: $(-4, 6)$ and $(10, 2)$

$$\left(\frac{-4+10}{2}, \frac{6+2}{2} \right)$$

$$\frac{6}{2}, \frac{8}{2}$$

center $\rightarrow (3, 4)$

$$(x-h)^2 + (y-k)^2 = r^2$$

$$(10-3)^2 + (2-4)^2 = r^2$$

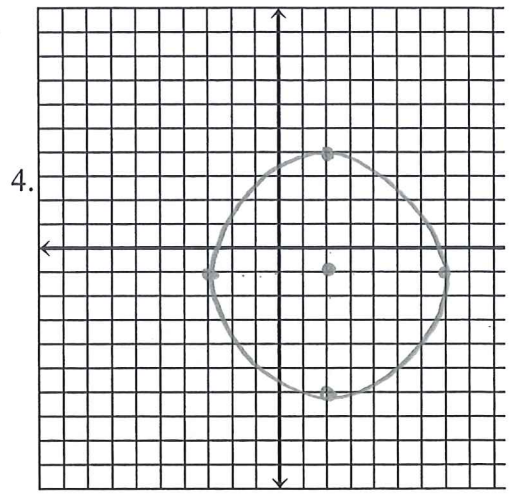
$$7^2 + (-2)^2 = r^2$$

$$49 + 4 = r^2$$

$$53 = r^2$$

$$(x-3)^2 + (y-4)^2 = 53$$

4. a. Sketch the circle: $(x-2)^2 + (y+1)^2 = 25$.



5. Find the center of the circle and radius. Graph it.

$$x^2 - 6x + y^2 - 4y - 5 = 0 \leftarrow \text{General Form}$$

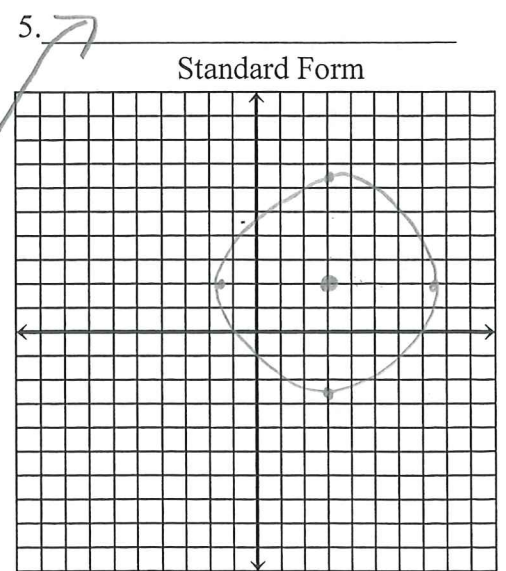
$$x^2 - 6x + 9 + y^2 - 4y + 4 = 5 + 9 + 4$$

$$(x-3)^2 + (y-2)^2 = 18$$

$$(3, 2)$$

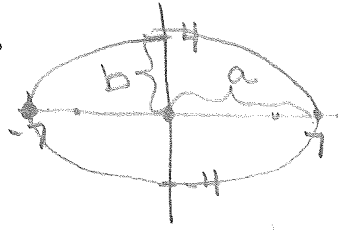
$$r = \sqrt{18}$$

$$\sim 4.3$$



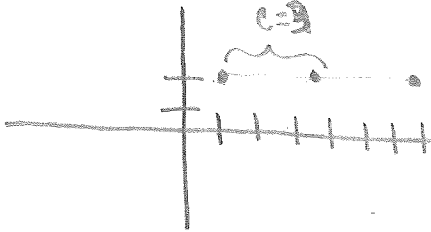
For #6-9, find the equation of each ellipse under the given conditions.

6. foci on the x-axis; x-intercepts ± 7 ,
y-intercepts ± 4 , center $(0,0)$



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

7. foci $(1,2)$ and $(7,2)$; length of major axis 20



$$\frac{2a}{2} = \frac{20}{2}$$

$$a = 10$$

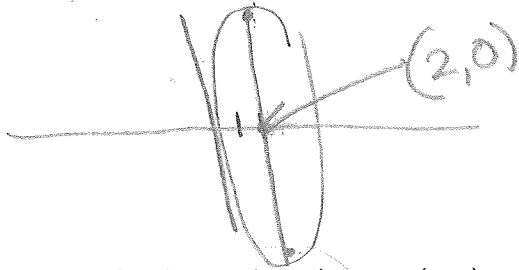
$$(4, 2)$$

$$a^2 - b^2 = c^2$$

$$100 - b^2 = 9$$

$$\frac{(x-4)^2}{100} + \frac{(y-2)^2}{91} = 1$$

8. vertices $(2,10)$ and $(2,-10)$; length of minor axis 6



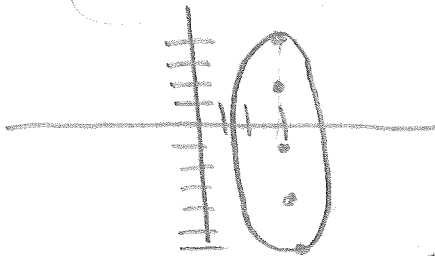
$$\frac{2b}{2} = \frac{6}{2}$$

$$b = 3$$

$$b^2 = 9$$

$$\frac{(x-2)^2}{9} + \frac{y^2}{100} = 1$$

9. vertices $(3,4)$ and $(3,-6)$; foci $(3,2)$ and $(3,-4)$



center $(3, -1)$

$$a^2 - b^2 = c^2$$

$$25 - b^2 = 9$$

$$a = 5$$

$$a^2 = 25$$

$$c = 3$$

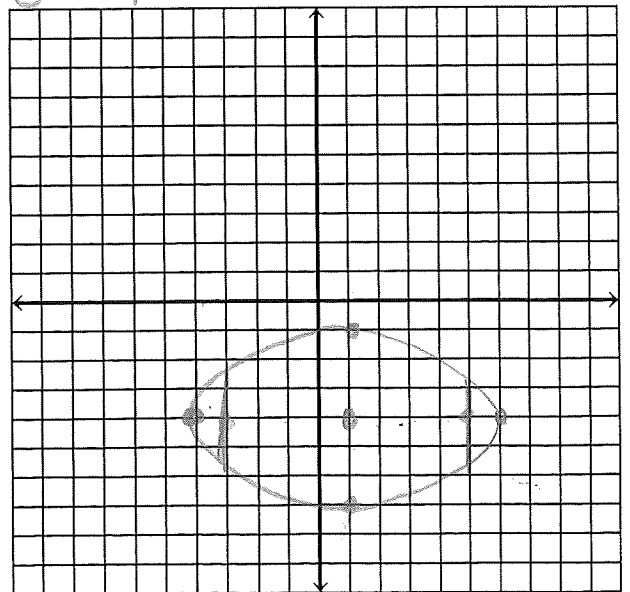
$$c^2 = 9$$

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

10. Sketch the ellipse:

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

- a. What is the length of the major axis 10
- b. What is the length of the minor axis 6
- c. What is the center $(1, -4)$
- d. What are the major vertices $(-4, -4)$ and $(6, -4)$
- e. What are the minor vertices $(1, -1)$ and $(1, -7)$
- f. What are the coordinates of the foci $(-3, -4)$ and $(5, -4)$



$$a^2 - b^2 = c^2$$

$$25 - 9 = c^2$$

$$16 = c^2$$

$$\pm 4 = c$$

$$\frac{2b^2}{a} = \frac{2 \cdot 9}{5} = \frac{18}{5}$$

11. What is the length of the latus rectum for problem #10.

12. What is the area of the ellipse for #10?

$$A = \pi \cdot a \cdot b$$

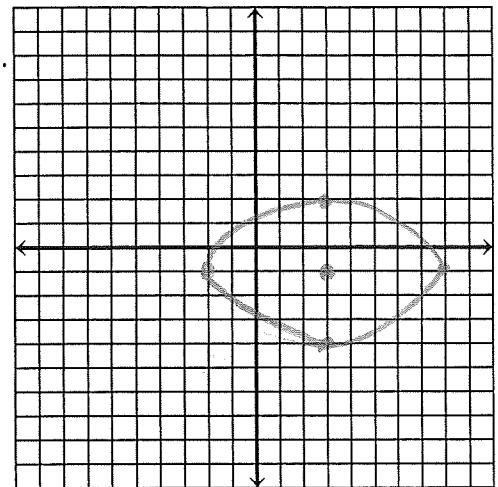
$$\pi \cdot 5 \cdot 3$$

$$15\pi \text{ u}^2$$

13. Sketch the ellipse: $\frac{9(x-3)^2}{225} + \frac{25(y+1)^2}{225} = \frac{225}{225}$.

$$\frac{(x-3)^2}{25} + \frac{(y+1)^2}{9} = 1$$

13.



14-17

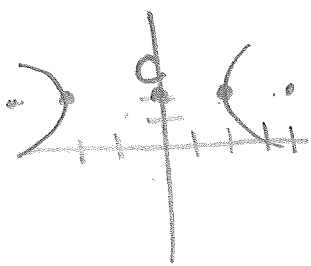
For #12-17, find the equation of each hyperbola under the given conditions.

14. vertices $(-2, 2)$ and $(2, 2)$; foci $(4, 2)$ and $(-4, 2)$

$$a^2 = 4$$

$$c^2 = 16$$

14. _____



center $(0, 2)$

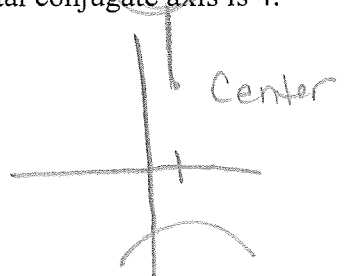
$$\frac{x^2}{4} - \frac{(y-2)^2}{12} = 1$$

$$a^2 + b^2 = c^2$$

$$4 + b^2 = 16$$

15. Center at $(1, 6)$ Vertical Transverse Axis is 10 and Horizontal conjugate axis is 4.

15. _____



$$2a = 10 \quad 2b = 4$$

$$a = 5 \quad b = 2$$

$$\frac{(y-6)^2}{25} - \frac{(x-1)^2}{4} = 1$$

16. Center (4, -2)
Focus (7, -2)
Vertex (6, -2)

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

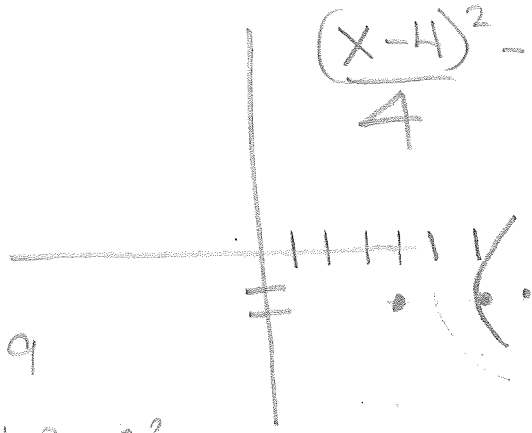
16. _____

$$c^2 = 9$$

$$a^2 + b^2 = c^2$$

$$4 + b^2 = 9$$

$$b^2 = 5$$



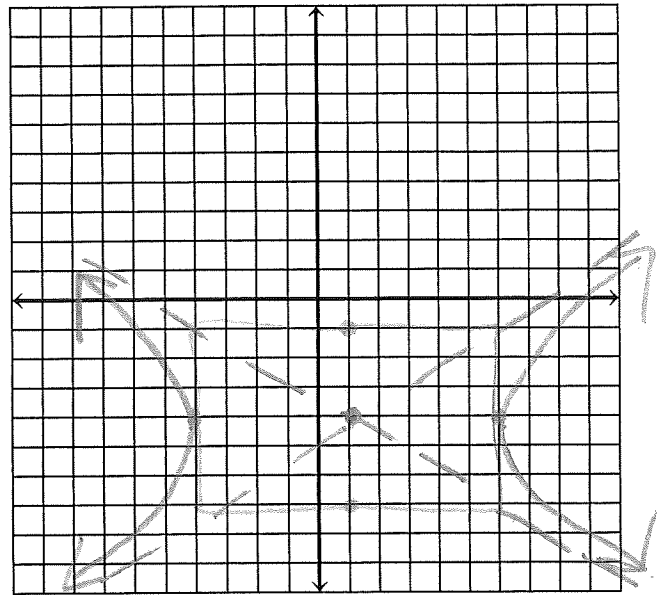
17. Sketch the hyperbola:

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

Use the asymptotes to help sketch the graph.

$$a = 5$$

$$b = 3$$



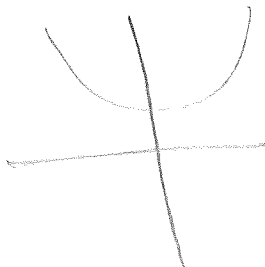
18. Given the hyperbola : $\frac{x^2}{25} - \frac{y^2}{9} = 1$, what are the equations of the asymptotes? _____

$$y^2 - x^2$$

$$y = \pm \frac{3}{5}x$$

19. Rewrite the equation in standard form

$$4y^2 - x^2 + 6x - 24y + 11 = 0$$



$$4y^2 - x^2 + 6x - 24y = -11$$

$$4y^2 - 24y + \underline{\quad} - x^2 + 6x + \underline{\quad} = -11 + 36 - 9$$

$$4(y^2 - 6y + \underline{9}) - 1(x^2 - 6x + \underline{9}) = 14$$

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

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

19. _____