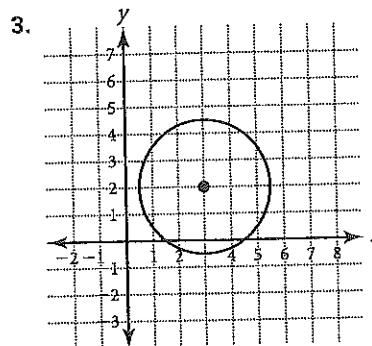
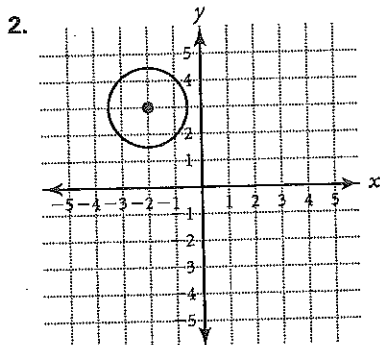
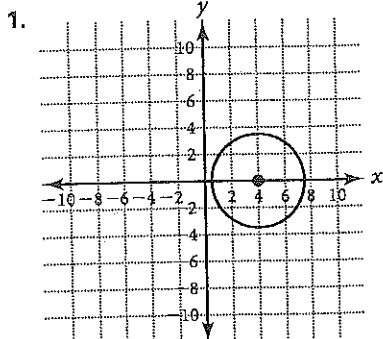


Part 1: Circles

Write the standard equation for each circle graphed below.



Write the standard equation of a circle with the given radius and center.

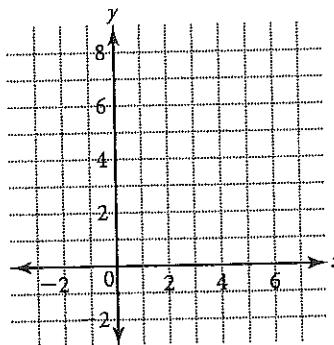
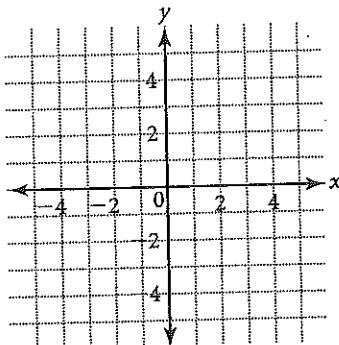
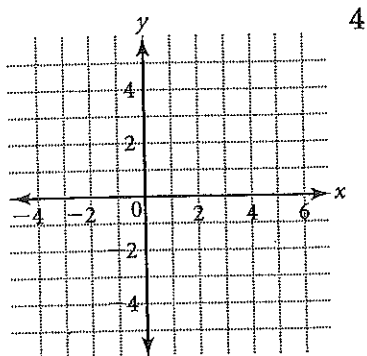
4.  $r = 2; C\left(\frac{1}{2}, 4\right)$

5.  $r = \frac{3}{4}; C\left(-2, \frac{3}{2}\right)$

6.  $r = 0.7; C(0.6, -0.3)$

Graph each equation. Label the center.

7.  $(x - 2)^2 + (y + 1)^2 = 12$     8.  $\left(x + \frac{1}{2}\right)^2 + \left(y - \frac{1}{2}\right)^2 = \frac{9}{4}$     9.  $\left(x - \frac{5}{2}\right)^2 + \left(y - \frac{7}{2}\right)^2 = \frac{25}{4}$



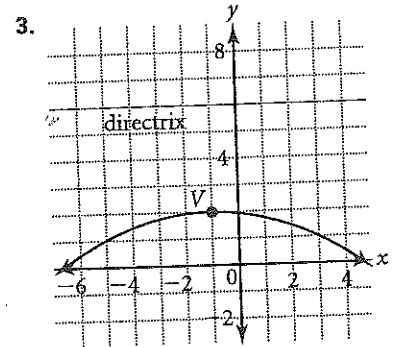
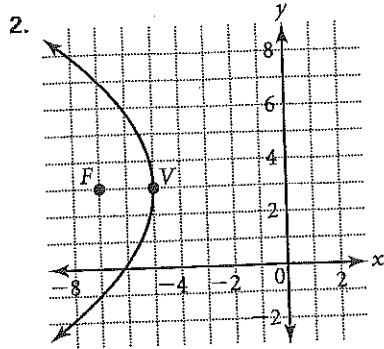
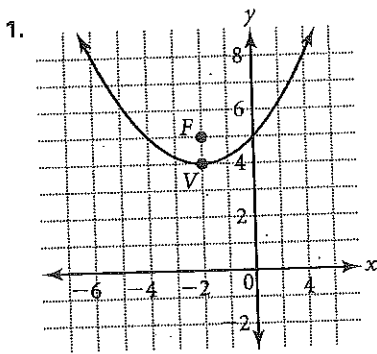
Write the standard equation for each circle. Then state the coordinates of its center and give its radius.

10.  $x^2 + y^2 + 4x - 8y - 16 = 0$

11.  $x^2 + y^2 - 3x - 5y - \frac{1}{2} = 0$

## Part 2: Parabolas

Write the standard equation for each parabola graphed below.

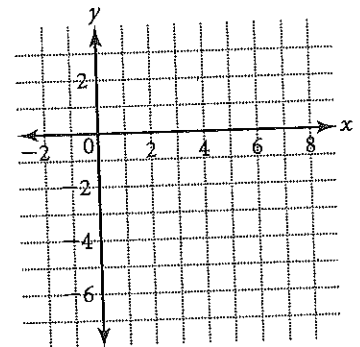
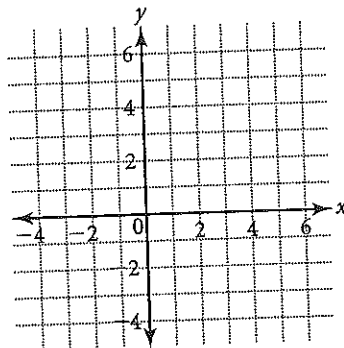
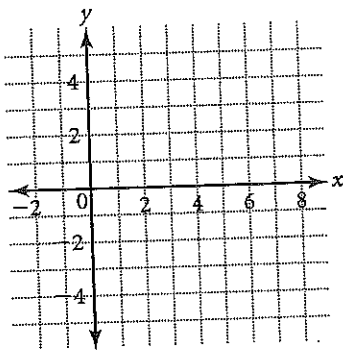


Graph each equation. Label the vertex, focus and directrix.

4.  $y = \frac{-1}{8}(x - 3)^2$

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

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



Write the standard equation for the parabola with the given characteristics.

7. vertex  $(-3, 2)$ ; focus  $(-3, -3)$  \_\_\_\_\_

8. vertex  $(5, 1)$ ; directrix:  $x = -1$  \_\_\_\_\_

9. focus  $(4, 2)$ ; directrix:  $y = -4$  \_\_\_\_\_

10. vertex  $(-5, -1)$ ; directrix:  $y = -3$  \_\_\_\_\_

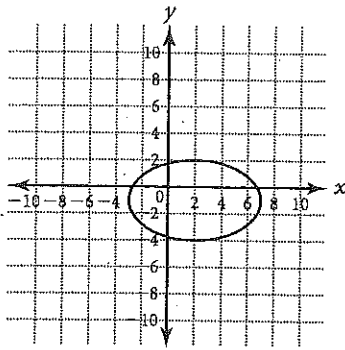
11. focus  $(3, 5)$ ; directrix:  $x = 5$  \_\_\_\_\_

12. focus  $(1, 6)$ ; vertex  $(1, -2)$  \_\_\_\_\_

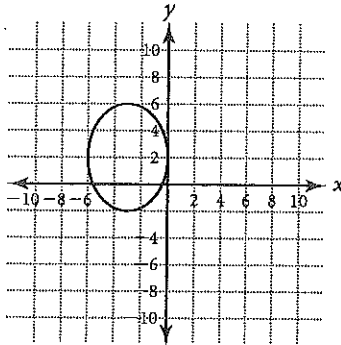
## Part 3: Ellipses

Write the standard equation for each ellipse.

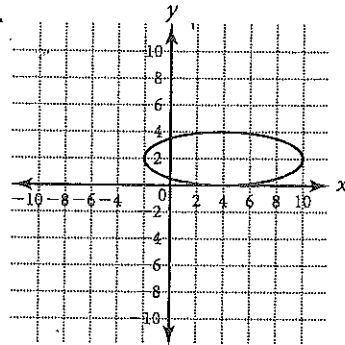
1.



2.

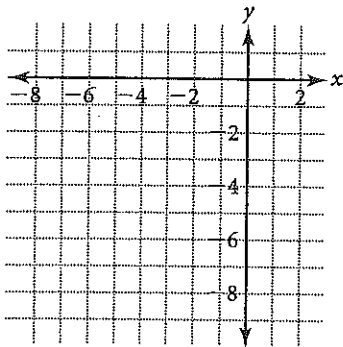


3.

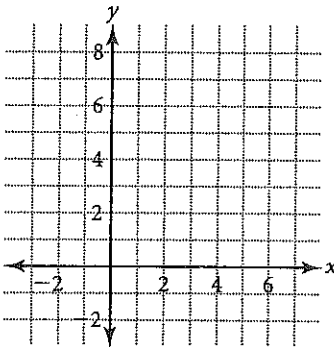


Sketch the graph of each ellipse. Label the center, foci, vertices, and co-vertices.

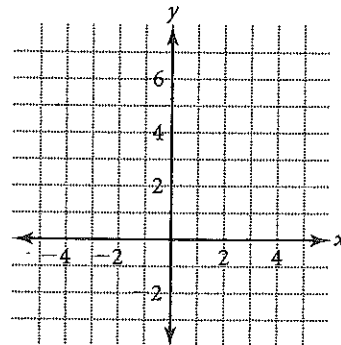
4.  $\frac{(x + 3)^2}{16} + \frac{(y + 4)^2}{10} = 1$



5.  $\frac{(x - 2)^2}{6} + \frac{(y - 4)^2}{9} = 1$



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



Write the standard equation for each ellipse.

7.  $x^2 + 3y^2 + 4x - 6y = 5$  \_\_\_\_\_

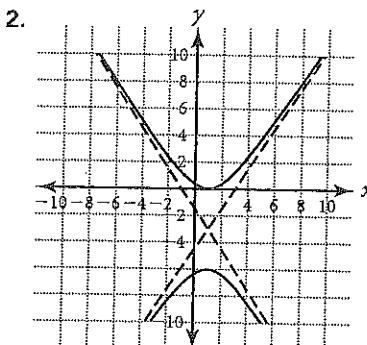
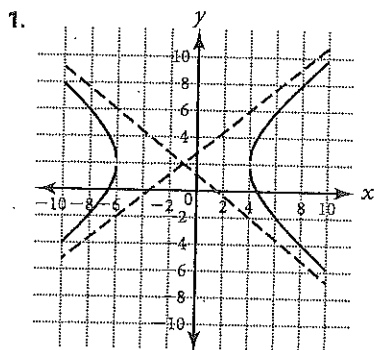
8.  $x^2 + 4y^2 + 4x - 24y = 60$  \_\_\_\_\_

9.  $9x^2 + 4y^2 - 18x + 8y = 23$  \_\_\_\_\_

10.  $4x^2 + 16y^2 - 8x + 64y = 28$  \_\_\_\_\_

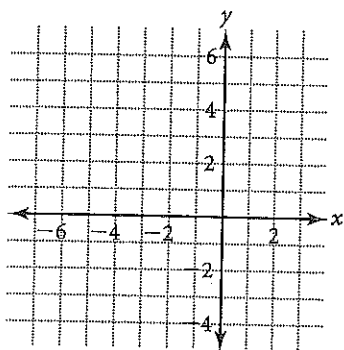
## Part 4: Hyperbolas

Write the standard equation for each hyperbola.

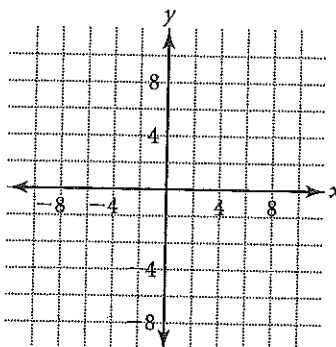


Graph each hyperbola. Label the center, vertices, co-vertices, foci and asymptotes.

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



4.  $\frac{(y + 1)^2}{16} - \frac{(x + 2)^2}{9} = 1$



Write the standard equation for the hyperbola with the given characteristics.

5.  $x^2 - 4y^2 + 6x + 16y = 11$  \_\_\_\_\_

6.  $4x^2 - y^2 - 8x + 10y = 33$  \_\_\_\_\_

7.  $y^2 - 2x^2 + 12x - 8y = 12$  \_\_\_\_\_

8.  $8y^2 - 3x^2 - 12x - 32y = 4$  \_\_\_\_\_

Part 5: Classify Conic Sections and Solve Systems of Conic Sections

Use the substitution method to solve each system. If there are no real-number solutions, write *none*.

1. 
$$\begin{cases} y = 2x^2 - 14 \\ x^2 + y^2 = 25 \end{cases}$$

---

2. 
$$\begin{cases} x = -5y^2 + 81 \\ 2x^2 + 4y^2 = 66 \end{cases}$$

---

3. 
$$\begin{cases} -x^2 + y = 1 \\ x + y^2 = 7 \end{cases}$$

---

Use the elimination method to solve each system. If there are no real-number solutions, write *none*.

4. 
$$\begin{cases} 5x^2 + 4y^2 = 145 \\ -3x^2 + 2y^2 = 23 \end{cases}$$

---

5. 
$$\begin{cases} x^2 + y^2 = 26 \\ 9x^2 - 4y^2 = -91 \end{cases}$$

---

6. 
$$\begin{cases} 3x^2 + 5y^2 = 75 \\ 4x^2 - 2y^2 = 100 \end{cases}$$

---

Solve each system by graphing. If there are no real-number solutions, write *none*.

7. 
$$\begin{cases} x^2 - y^2 = 4 \\ 9x^2 + 4y^2 = 36 \end{cases}$$

---

8. 
$$\begin{cases} x^2 + y^2 = 9 \\ y = x^2 + 3 \end{cases}$$

---

9. 
$$\begin{cases} 16x^2 - 4y^2 = 64 \\ 3x^2 - y = -1 \end{cases}$$

---

Classify the conic section defined by each equation. Write the standard equation of the conic section.

10.  $x^2 + y - 2x + 3y = 0$

---

11.  $9x^2 - 4y^2 + 18x + 16y = 23$

---

12.  $16x^2 + 25y^2 + 80x + 625y = 125$

---

13.  $4x^2 + 4y^2 - 64 = 0$

---

14.  $x - 2y^2 + 6y - 4 = 0$

---

15.  $6x^2 - 2y^2 + 18x + 4y = 20$

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