

Conics- The Ellipse

Write each of the following in standard form. Identify the center of each ellipse, as well as whether the ellipse has a Horizontal or Vertical Major Axis.

1. $9x^2 + 4y^2 + 54x - 48y + 189 = 0$

2. $x^2 + 4y^2 - 10x - 16y + 25 = 0$

3. $4x^2 + 3y^2 + 16x + 42y + 151 = 0$

4. $4x^2 + 25y^2 + 16x + 150y + 141 = 0$

5. $x^2 + 4y^2 - 14x - 16y + 29 = 0$

6. $15x^2 + 4y^2 - 90x - 48y + 219 = 0$

Graph each of the following. Label the center, the four vertices and the foci.

7. $\frac{(x-7)^2}{9} + \frac{(y+1)^2}{64} = 1$

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

9. $25x^2 + 4y^2 - 150x - 8y + 129 = 0$

10. $9x^2 + 16y^2 - 72x - 96y + 144 = 0$

11. $9x^2 + y^2 + 72x + 6y + 144 = 0$

12. $x^2 + 9y^2 + 2x + 54y + 46 = 0$

13. $9x^2 + 49y^2 + 294y = 0$

14. $25x^2 + 4y^2 - 200x + 300 = 0$

15. $9x^2 + 16y^2 - 54x - 64y + 1 = 0$

16. $9x^2 + y^2 - 72x + 8y + 124 = 0$

Find the equation of the ellipse given the following.

17. Find the equation of the ellipse in standard form that has a center at $(-3,2)$, a vertical major axis of 16 units, and a horizontal minor axis of 10 units.
18. Find the equation of the ellipse in standard form that has a center at $(4,7)$, a vertical minor axis of 12 units, and a horizontal major axis of 20 units.
19. Find the equation of the ellipse in standard form that has a center at $(-2,-5)$, a vertical major axis of 10 units, and a horizontal minor axis of 4 units.
20. Find the equation of the ellipse that has the center at the origin, x-intercepts of $(-3,0)$ and $(3,0)$, and y-intercepts of $(0,7)$ and $(0,-7)$.
21. Find the equation of the ellipse that has the center at the origin, an x-intercept of $(12,0)$, and a y-intercept of $(0,3)$.
22. Find the equation of an ellipse that has vertices of $(-1,5)$, $(3,13)$, $(7,5)$ and $(3,-3)$.
23. Find the equation of an ellipse that has vertices of $(-7,7)$, $(-2,9)$, $(3,7)$ and $(-2,5)$.
24. Find the equation of an ellipse that has vertices of $(1,-6)$, $(5,3)$, $(9,-6)$ and $(5,-15)$.
25. Find the equation of an ellipse that has foci of $(6,0)$ and $(6,6)$ and the sum of the focal radii is 10.