Graph the equation. Identify the important characteristics of the graph.

1. \(x^2 + (y - 3)^2 = 9\)

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

3. \((x - 3)^2 = 8(y + 4)\)

4. \(\frac{(y + 2)^2}{18} - \frac{(x + 1)^2}{25} = 1\)

5. \(\frac{(x + 3)^2}{32} + \frac{(y - 4)^2}{36} = 1\)

6. \((x - 5)^2 + (y + 2)^2 = 28\)

Write an equation of the conic section.

7. Circle with a center at \((2, -6)\) and a radius of 4

8. Parabola with vertex \((3, 3)\) and focus at \((3, 0)\)

9. Ellipse with vertices at \((-2, -1)\) and \((-2, 7)\) and co-vertices at \((-4, 3)\) and \((0, 3)\)

10. Hyperbola with vertices at \((2, 4)\) and \((8, 4)\) and foci at \((-2, 4)\) and \((12, 4)\)

Identify the line(s) of symmetry for the conic section.

11. \((y - 2)^2 = 16(x - 6)\)

12. \((x - 3)^2 + (y + 4)^2 = 48\)

13. \(\frac{(x - 7)^2}{81} + \frac{y^2}{62} = 1\)

14. \(\frac{(y + 5)^2}{24} - (x - 3)^2 = 1\)
LESSON 9.6 Practice B continued
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Use the discriminant to classify the conic section.

15. \(2x^2 + 5x + y + 14 = 0\)
16. \(4x^2 + 4y^2 - 6x + 8y - 10 = 0\)
17. \(5x^2 - 5y^2 + 4x - 3y + 4 = 0\)
18. \(x^2 + 4y^2 - 8x - 12y - 2 = 0\)

Classify the conic section and write its equation in standard form. Then graph the equation.

19. \(y^2 + 8x - 2y - 15 = 0\)
20. \(x^2 + y^2 - 12x + 2y + 15 = 0\)

21. \(x^2 - 9y^2 + 54y - 90 = 0\)
22. \(9x^2 + 36y^2 + 54x - 144y - 99 = 0\)

23. \(x^2 + 10x - 6y + 7 = 0\)
24. \(-2x^2 + 5y^2 + 24x - 20y - 102 = 0\)

25. **Designing a Menu** As part of the graphics art department, your job is to create various art pieces and graphical models for your documents. Your newest project is to design a menu that incorporates the picture of a tree. The equation used to model the tree trunk is \(9x^2 - y^2 + 8y - 52 = 0\). Write this equation in standard form and then graph the equation.

26. **Long Jump** A competitor’s first long jump can be modeled by \(x^2 - 20x + 20y = 0\) where \(x\) and \(y\) are measured in feet and the origin marks the start of the jump. Write the equation in standard form. How far was the first jump?