

Precalculus Unit 8 Review

Name _____ period _____ date _____

Identify the type of conic, list all the key features, and accurately draw a graph.

- For circles, list the center and radius.
- For parabolas, list the vertex, focus, and directrix.
- For ellipses, list the center, vertices, and foci.
- For hyperbolas, list the center, vertices, foci, transverse axis, and asymptotes.

1. $x^2 = -12y$

2. $\frac{x^2}{16} - \frac{y^2}{4} = 1$

3. $(x-2)^2 + y^2 = 25$

4. $\frac{(x-1)^2}{49} + \frac{(y+5)^2}{9} = 1$

5. $4x^2 + y^2 = 64$

6. $(y+3)^2 = 8(x-2)$

7. $(x+1)^2 + (y+2)^2 = 12$

8. $4(y-3)^2 - 36(x-4)^2 = 36$

Write the following equations in standard form and identify the type of conic.

9. $x^2 + y^2 + 8x - 33 = 0$

10. $25x^2 + 9y^2 + 250x - 36y - 239 = 0$

11. $9x^2 - 4y^2 - 108x + 8y - 4 = 0$

12. $y^2 + 4x + 20y + 64 = 0$

13. Write the standard form of the equation of the circle with radius $r = 4$ and center $(2, -5)$.

14. Write the standard form of the equation of a circle with center at the point $(1, 6)$ that is tangent to the line $x = 3$.

15. Write the standard form of the equation of a circle where $C(2, -5)$ and $D(6, 1)$ are endpoints of a diameter.
16. Write the standard form of the equation of the parabola with focus $(1, -1)$ and directrix $y = -5$.
17. Write the standard form of the equation of the parabola with vertex $(-2, -3)$, axis of symmetry $y = -3$, and x -intercept $(-7, 0)$.
18. A parabolic reflector (paraboloid of revolution) is used by TV crews at football games to pick up the referee's announcements, quarterback signals, and so on. A microphone is placed at the focus of the paraboloid. If a certain reflector is 48 inches wide and 18 inches deep, where should the microphone be placed?

19. Write the standard form of the equation of an ellipse with foci at $(-4, 2)$ and $(-4, 8)$ and vertex at $(-4, 10)$.
20. A hall 100 feet in length was designed as a whispering gallery. If the ceiling is 20 feet high at the center, how far from the center are the foci located?
21. A bridge is built in the shape of a semielliptical arch. The bridge has a span of 60 feet. At a distance of 10 feet from the center, the height of the bridge is 15 feet. Find the height of the bridge at its center.
22. Find the equation for the hyperbola with vertices at $(0, \pm 5)$ and foci at $(0, \pm 7)$.

23. Find the equation for the hyperbola with center $(2,3)$, focus $(0,3)$, and vertex $(1,3)$.