

Part I: For each of the following, state the name of the conic and include:

• Circles: Center and radius

• Parabolas: Vertex, focus, directrix, "a" value, and direction it opens

• Ellipses: Center, endpoints of major and minor axes, and foci

• Hyperbolas: Center, vertices, endpoints of transverse axis, slopes of asymptotes

Part II: Graph each equation on the separate sheet of graph paper provided.

1)
$$x^2 + y^2 = 16$$

2)
$$x^2 = 8(y-2)$$

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

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

5)
$$x^2 - 6x + y^2 - 8y = 0$$

6)
$$(y+2)^2 = -12(x+3)$$

7)
$$\frac{(x-3)^2}{12} + \frac{(y+2)^2}{21} = 1$$

$$8) \ 4y^2 - 9x^2 = 36$$

9)
$$(x-3)^2 + (y+2)^2 = 9$$

10)
$$y^2 + 4y - 4x = 0$$

11)
$$x^2 - y^2 = 9$$

12)
$$2x^2 + 4y^2 + 4x - 12y = 5$$

Part III: For each of the following, write an equation in standard form.

1) Circle; center at (-4,1); radius = 7

1)_____

2) Circle; center at (2,5); contains (5,9)

2)_____

3) Parabola; vertex at (0,2); Directrix x = -2

3)_____

5) Ellipse; foci at (6,0) and (-6,0); minor axis length = 16

5)_____

6) Ellipse; foci at (0,3) and (0,-3); endpoints of major axis (0,5) and (0,-5)

6)_____

7) Hyperbola; foci at (13,0) and (-13,0); transverse axis length = 24

7)_____

8) Hyperbola; vertices (4,1) and (-4,1); ends of conjugate axis at (0,4) and (0,-2)

8)_____

Part IV: Write parametric equations for each of the following.

1) An ellipse with major axis endpoints of (6,3),(-2,3) and minor axis endpoints of (2,6),(2,0).

2) An ellipse with standard equation $\frac{(x+3)^2}{5} + \frac{(y-2)^2}{12} = 1$

3) A hyperbola with vertices at (6,3),(-2,3) and foci at (7,3),(-3,3).

4) A hyperbola with standard equation $-\frac{(x-3)^2}{16} + \frac{(y+2)^2}{9} = 1$

5) A circle that is tangent to the x-axis at (5,0) and the y-axis at (0,5).