

1. Find the center and radius of a circle with the equation  $x^2 - 10x + y^2 - 14y + 25 = 0$ .

Center = \_\_\_\_\_ Radius = \_\_\_\_\_

2. Points P (3, -5) and Q (-1, 3) are the endpoints of the diameter of a circle. Find the center, radius, and equation of the circle.

Center = \_\_\_\_\_ Radius = \_\_\_\_\_ Equation = \_\_\_\_\_

3. Write the equation of the line tangent to the circle  $(x - 4)^2 + (y + 5)^2 = 45$  at the point (1,1).

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4. Write the equation of the circle with center (3, -1) and the circle is tangent to the line  $x = 4$ .

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5. Sketch the ellipse  $25x^2 + 16y^2 = 400$ . Find the coordinates of its vertices and foci.

Vertices = \_\_\_\_\_ Foci = \_\_\_\_\_

6. Find the standard form of the equation of the ellipse having vertex (0, -9) and minor axis 12 units long. Graph and identify all critical aspects.

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7. Write the standard form of the ellipse  $x^2 - 10x + 4y^2 + 16y + 37 = 0$ . Graph and identify all critical aspects.

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Circles  
(review)

8. Write the standard form of the ellipse having major axis of length 12 and foci  $(-4, -1)$  and  $(-4, 7)$ .

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9. Sketch the hyperbola  $16x^2 - 25y^2 = 400$ . Find the coordinates of its vertices and foci and equations of the asymptotes.

Vertices = \_\_\_\_\_ Foci = \_\_\_\_\_

Asymptotes = \_\_\_\_\_

10. Write the standard form of the hyperbola with vertices  $(0, 2)$  and  $(0, -2)$  and asymptotes  $y = \pm \frac{1}{2}x$ . Find the foci and sketch the hyperbola. \_\_\_\_\_

11. Graph the hyperbola  $\frac{(y+2)^2}{25} - \frac{(x-3)^2}{16} = 1$ . State the coordinates of the center, vertices, and foci. Give the equations of the asymptotes. \_\_\_\_\_

Center = \_\_\_\_\_ Vertices = \_\_\_\_\_

Foci = \_\_\_\_\_ Asymptotes = \_\_\_\_\_

12. Find the standard form of the hyperbola  $4x^2 - 8x - 9y^2 - 36y = 68$ . Identify the center, vertices, and foci.

Center = \_\_\_\_\_ Vertices = \_\_\_\_\_

Foci = \_\_\_\_\_

13. Find the equation of a parabola vertex  $(0, 0)$  and directrix  $y = -2$ . Sketch the graph.

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14. Find the standard equation of the parabola with equation  $6x - x^2 = 8y + 1$ . Find the vertex, focus, directrix, and sketch the graph.

Vertex \_\_\_\_\_ Focus \_\_\_\_\_ Directrix \_\_\_\_\_

15. Convert  $y^2 + 6y - 2x + 9 = 0$  into standard form. Identify the vertex, focus, and directrix.

\_\_\_\_\_ Vertex = \_\_\_\_\_ Focus = \_\_\_\_\_ Directrix = \_\_\_\_\_