

Do 1-8 on a separate sheet of paper.

- a) Identify the conic (circle, parabola, ellipse, or hyperbola).  
b) If it is a circle, identify the center and radius.  
If it is a parabola, identify the vertex, focus, directrix, and points that define the latus rectum.  
If it is an ellipse, identify the center, vertices, and foci.  
If it is a hyperbola, identify the center, transverse axis, vertices, foci, and asymptotes.  
c) Graph the conic.

1.  $2x^2 - y^2 + 4x + 4y - 4 = 0$

2.  $9x^2 + 4y^2 - 18x + 16y - 11 = 0$

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

4.  $2x^2 + 2y^2 - 12x + 8y - 24 = 0$

5.  $(y + 1)^2 = -4(x - 2)$

6.  $(x + 5)^2 + 4(y - 4)^2 = 16$

7.  $x^2 + 8x = 4y - 8$

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

Write the equation(s) of the circle with the given characteristics:

9. Center  $(-4, 3)$  tangent to the  $x$  - axis.

10. Radius 5 tangent to the line  $x = 2$ .

Write the standard form equation of the parabola with the given characteristics:

11. Vertex  $(3, 1)$  Focus:  $(1, 1)$

12. Vertex  $(-4, 2)$  containing pt.  $(-2, 3)$

Write the standard form equation of the ellipse with the given characteristics:

13. Focus  $(-4, 0)$  Vertices  $(\pm 5, 0)$

14. Center  $(-1, 1)$  Vertex  $(-1, 2)$  Foci  $(-1, \frac{1}{4})$

Write the standard form equation of the hyperbola with the given characteristics:

15. Focus  $(0, 6)$  Vertices  $(0, -2)$  &  $(0, 2)$

16. Foci  $(3, 7)$  &  $(7, 7)$  Vertex  $(6, 7)$

17. A satellite dish is in the shape of a paraboloid. Find the location of the receiver, which is placed at the focus, if the dish is 6 feet across at its opening and 2 feet deep.