## **Chapter 10 Review**

Review is due on day of the test. Remember to show <u>all</u> work & answers on a <u>separate sheet of paper</u> (other than the graphs, which you may draw using the blank graphs on the back of this paper, make sure to number graphs!).

Simplify the rational expression. State any restrictions on the variable.

1. 
$$\frac{z^2 + 9z + 20}{z^2 + 12z + 32}$$

Multiply or divide. State any restrictions on the variables.

2. 
$$\frac{d^2}{d+5} \cdot \frac{d^2+4d-5}{d^2-5d}$$
 3.  $\frac{x+4}{x+2} \div \frac{x-1}{x^2-3x-10}$ 

Add or subtract. Simplify if possible.

4. 
$$\frac{t^2 + 11t + 28}{t^2 + 6t + 8} - \frac{2}{t + 2}$$
5. 
$$\frac{c^2 + 6c - 16}{c^2 - 3c + 2} + \frac{3}{c - 12}$$

Simplify the complex fraction.

$$6. \quad \frac{\frac{2}{w} - \frac{4}{4w}}{\frac{3}{2w} + \frac{1}{2w}}$$

- 7. Alicia can row 5 miles downstream in the same time it takes her to row 2 miles upstream. She rows downstream 2 miles/hour faster than she rows upstream. Find Alicia's rowing rate each way. Round your answers to the nearest tenth, if necessary.
- 8. Write an equation for a graph that is the set of all points in the plane that are equidistant from the point F(10, 0) and the line x = -10.
- 9. Write an equation of a parabola with a vertex at the origin and a focus at (0, -3).
- 10. Write an equation of a parabola with a vertex at the origin and a directrix at y = 5.
- 11. Identify the focus and the directrix of the graph of  $24x = y^2$ .
- 12. Identify the vertex, focus, and directrix of the graph of  $12(y + 3) = (x + 3)^2$ . Then graph the parabola.
- 13. Identify the vertex, focus, and directrix of the graph of  $-16(x + 2) = (y 4)^2$ . Then graph the parabola.
- 14. Write an equation of a circle with center (5, 6) and radius 8.
- 15. Write an equation for the translation of  $x^2 + y^2 = 49$ , 8 units right and 2 units up.
- 16. Find the center and radius of the circle with equation  $(x + 5)^2 + (y 5)^2 = 49$ .
- 17. Find the center and radius. <u>Then graph</u>  $(x 6)^2 + (y 8)^2 = 25$ .
- 18. Write an equation in standard form of an ellipse that has a vertex at (-2, 0), a co-vertex at (0, -5), and is centered at the origin.
- 19. An elliptical track has a major axis that is 62 yards long and a minor axis that is 24 yards long. Find an equation for the track if its center is (0, 0) and the major axis is the *x*-axis.

20. Find the foci of the ellipse with the equation  $\frac{x^2}{16} + \frac{y^2}{36} = 1$ . Graph the ellipse.

- 21. Write an equation of the ellipse with foci at  $(0, \pm 3)$  and vertices at  $(0, \pm 9)$ . Graph the ellipse.
- 22. Suppose that the path of a newly discovered comet could be modeled by using one branch of the equation  $\frac{x^2}{16} \frac{y^2}{25} = 1$ , where distances are measured in astronomical units. Name the vertices and foci of the hyperbola.
- 23. Find the foci of the graph  $\frac{x^2}{25} \frac{y^2}{9} = 1$ . Draw the graph.
- 24. Find the equation of a hyperbola with a = 452 units and c = 765 units. Assume that the transverse axis is horizontal.
- 25. Write an equation of an ellipse with center (3, 3), vertical major axis of length 12, and minor axis of length 6.
- 26. Write an equation of a hyperbola with vertices (1, 4) and (-5, 4), and foci (3, 4) and (-7, 4).
- 27. Write an equation of a hyperbola with vertices (3, 1) and (3, -7), and foci (3, 5) and (3, -11).

Identify the conic section. If it is a parabola, give the vertex. If it is a circle, give the center and radius. If it is an ellipse or a hyperbola, give the center and foci.

- 28.  $5x^2 + 15y^2 30x + 150y + 345 = 0$ 30.  $6x^2 - 11y^2 + 24x - 88y - 218 = 0$ 
  - 32.  $x^2 + y^2 10x 8y = -32$

$$29. \quad y^2 - 4x - 10y + 37 = 0$$
$$31. \quad y^2 - 3x + 8y + 10 = 0$$
$$33. \quad 5x^2 - 2y^2 - 40x + 8y + 62 = 0$$

