Algebra II - Chapter 10 Test Review

Please do all work on a separate paper.
REVIEWS ARE REQUIRED FOR RETEST ELIGIBILITY. NO LATE REVIEWS ACCEPTED

1. Simplify $\sqrt[3]{24a^7b^{12}}$. Assume that all variables are positive.

2. $\frac{a^2 - 2a - 35}{a^2 + 12a + 35}$

3. $\frac{d^2 + 10d + 24}{d^2 + d - 12} + \frac{10}{d - 3}$

4. $3 \log_a y + 6 \log_a x$

#5 – 7. Graph the conic section.

5. $(x - 6)^2 + (y + 3)^2 = 49$

6. $x - 5 = \frac{1}{8} (y + 3)^2$.

7. $y + 4 = \frac{1}{24} (x + 2)^2$.

8. Write an equation for a graph that is the set of all points in the plane that are equidistant from the point $F(-2, 0)$ and the line $x = 2$.

9. Write an equation for a graph that is the set of all points in the plane that are equidistant from the point $F(0, 9)$ and the line $y = -9$.

10. Write an equation of a parabola with a vertex at the origin and a focus at $(0, 7)$.

11. Write an equation of a parabola with a vertex at the origin and a focus at $(-5, 0)$.

12. Identify the vertex, focus, and directrix of the graph of $y = \frac{1}{8} (x + 3)^2 + 4$.

13. Identify the vertex, focus, and directrix of the graph of $x = \frac{1}{20} (y - 5)^2 + 2$.

14. Write an equation of a circle with center $(3, 3)$ and radius 5.

15. Write an equation for the translation of $x^2 + y^2 = 25$, 4 units right and 6 units up.

16. Write an equation for the translation of $x^2 + y^2 = 9$, 7 units left and 2 units down.

17. Find the center and radius of the circle with equation $(x + 8)^2 + (y - 6)^2 = 36$.

18. Find the center and radius of the circle with equation $(x - 2)^2 + (y + 7)^2 = 25$.

19. Write an equation in standard form of an ellipse that has a vertex at $(-3, 0)$, a co-vertex at $(0, -2)$, and is centered at the origin.

20. Write an equation of the ellipse with foci at $(0, \pm 5)$ and vertices at $(0, \pm 9)$.

21. Write an equation of the ellipse with foci at $(\pm 6, 0)$ and vertices at $(\pm 8, 0)$.

22. Write an equation for an ellipse with center $(-2, 3)$, vertices $(-2, 8)$ and $(-2, -2)$, and co-vertices $(-6, 3)$ and $(2, 3)$. Graph the ellipse.

23. Write an equation of an ellipse with center $(-4, 5)$, vertical major axis of length 12, and minor axis of length 4. Graph the ellipse.
24. Find the foci of the graph \( \frac{x^2}{36} - \frac{y^2}{16} = 1 \).

25. Find the equation of a hyperbola with \( a = 31 \) units and \( c = 76 \) units. Assume that the transverse axis is horizontal.

26. Write an equation of a hyperbola with a vertex at \((0, 4)\) and a focus at \((0, 5)\). Assume the transverse axis is vertical and the center is at the origin.  **Graph the hyperbola.**

27. Write an equation of a hyperbola with vertices \((8, -4)\) and \((-4, -4)\), and foci \((12, -4)\) and \((-8, -4)\).  **Graph the hyperbola.**

# 28–35. Identify the conic section (circle, ellipse, hyperbola, or parabola).
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. \( x^2 + y^2 + 4x + 4y = 28 \)  

29. \( y^2 - 4x + 4y - 8 = 0 \)

30. \( 7x^2 - 3y^2 + 70x + 18y + 127 = 0 \)

31. \( 2x^2 + 12y^2 - 20x - 48y + 74 = 0 \)

32. \( 5x^2 - 6y^2 + 50x + 60y - 55 = 0 \)

33. \( 5x^2 + 10y^2 + 40x + 40y + 70 = 0 \)

34. \( y^2 - 2x - 10y + 19 = 0 \)

35. \( x^2 + y^2 - 6x - 8y = 0 \)
Chapter 10 Review
Answer Section

1. \(2a^2 b \sqrt[3]{3a}\)
2. \(\frac{a - 7}{a + 7}; a \neq -5, a \neq -7\)
3. \(\frac{d + 16}{d - 3}\)
4. \(\log_b (y^3 x^6)\)

5. 

6. 

7. 

8. \(x = -\frac{1}{8} y^2\)
9. \(x = \frac{1}{36} y^2\)
10. \(y = \frac{1}{28} x^2\)
11. \(x = -\frac{1}{20} y^2\)
12. vertex (-3, 4), focus (-3, 6), directrix at \(y = 2\)
13. vertex (2, 5), focus (5, 7), directrix at \(y = -3\)
14. \((x - 3)^2 + (y - 3)^2 = 25\)
15. \((x - 4)^2 + (y - 6)^2 = 25\)
16. \((x + 7)^2 + (y + 2)^2 = 9\)
17. (-8, 6); 6
18. (2, -7); 5
19. \(\frac{x^2}{9} + \frac{y^2}{4} = 1\)
20. \( \frac{x^2}{56} + \frac{y^2}{81} = 1 \)

21. \( \frac{x^2}{28} + \frac{y^2}{64} = 1 \)

22. \( \frac{(x+2)^2}{16} + \frac{(y-3)^2}{25} = 1 \)

23. \( \frac{(x + 4)^2}{4} + \frac{(y - 5)^2}{36} = 1 \)

24. \((\pm 2\sqrt{13}, 0)\)

25. \( \frac{x^2}{961} - \frac{y^2}{5776} = 1 \)
26. \[ \frac{y^2}{16} - \frac{x^2}{9} = 1 \]

27. \[ \frac{(x - 2)^2}{36} - \frac{(y + 4)^2}{64} = 1 \]

28. Circle; center \((-2, -2); radius = 6\)

29. Parabola; vertex \((-3, -2)\)

30. Hyperbola with center \((-5, 3)\), foci at \((-5 \pm \sqrt{10}, 3)\)

31. Ellipse with center \((5, 2)\), foci at \((5 \pm \sqrt{10}, 2)\)

32. Hyperbola with center \((-5, 5)\), foci at \((-5 \pm \sqrt{11}, 5)\)

33. Ellipse with center \((-4, -2)\), foci at \((-4 \pm \sqrt{5}, -2)\)

34. Parabola; vertex \((-3, 5)\)

35. Circle; center \((3, 4); radius = 5\)