Algebra II Chapter 10 (Conic Sections) Review

The review for the final must be completed by the date of the original final exam in order to be eligible for a reassessment in the event of a failing final exam.

Please show all work and answers on separate paper. The test will contain ~25 total questions. Test reviews are due on test day - NO LATE REVIEWS ACCEPTED.

1. Write an equation for a graph that is the set of all points in the plane that are equidistant from the point $F(-7, 0)$ and the line $x = 7$. *(Page 565, Example #1)*
2. Write an equation for a graph that is the set of all points in the plane that are equidistant from the point $F(-3, 0)$ and the line $x = 3$.
3. Write an equation of a parabola with a vertex at the origin and a focus at (–2, 0). *(Page 566, Example #2)*
4. Write an equation of a parabola with a vertex at the origin and a focus at (0, –7).
5. Write an equation of a parabola with a vertex at the origin and a directrix at $y = 5$.
6. Write an equation of a parabola with a vertex at the origin and a directrix at $y = -7$.
7. Identify the focus and the directrix of the graph of $y = -\frac{1}{12}x^2$. *(Page 567, Example #4)*
8. Identify the focus and the directrix of the graph of $x = \frac{1}{8}y^2$.
9. Identify the vertex, focus, and directrix of the graph of $y = \frac{1}{8}(x - 2)^2 + 5$. Graph the parabola. *(Page 568, Example #5)*
10. Identify the vertex, focus, and directrix of the graph of $y = \frac{1}{20}(x - 5)^2 + 2$. Graph the parabola.
11. Write an equation of a circle with center (–5, –8) and radius 2. *(Page 572, Example #1)*
12. Write an equation of a circle with center (–8, –2) and radius 5.
13. Write an equation for the translation of $x^2 + y^2 = 25$, 2 units right and 4 units down. *(Page 572, Example #2)*
14. Write an equation for the translation of $x^2 + y^2 = 64$, 5 units left and 7 units up.
15. Find the center and radius of the circle with equation $(x + 5)^2 + (y + 3)^2 = 16$. Graph the circle. *(Page 574, Example #5)*
16. Write an equation in standard form of an ellipse that has a vertex at (5, 0), a co-vertex at (0, –3), and is centered at the origin. *(Page 579, Example #1)*
17. Write an equation in standard form of an ellipse that has a co-vertex at (2, 0), a vertex at (0, 4), and is centered at the origin.
18. Find the foci of the ellipse with the equation $\frac{x^2}{49} + \frac{y^2}{64} = 1$. Graph the ellipse. *(Page 580, Example #3)*
19. Find the foci of the ellipse with the equation $\frac{x^2}{25} + \frac{y^2}{49} = 1$. Graph the ellipse.
20. Write an equation of an ellipse with center (–4, 4), vertical major axis length 14, and minor axis length 8. *(Page 593, Example #1)*
21. Write an equation of an ellipse with center (–2, –5), vertical major axis length 10, and minor axis length 8.

22. Write an equation of a hyperbola with vertices (2, –3) and (–10, –3), and foci (6, –3) and (–14, –3).
(Page 594, Example #2)

23. Write an equation of a hyperbola with vertices (4, –4) and (–8, –4), and foci (8, –4) and (–12, –4).

Graph the conic sections. *(Page 586, Example #1)*

24. Graph $4x^2 - 9y^2 = 36$.

25. Graph $16y^2 - 9x^2 = 144$.

26. Graph $16(x + 3)^2 - 4(y - 2)^2 = 64$.

27. Graph $5(y - 2)^2 - 25(x + 4)^2 = 100$.

Write the equations in standard form *(this section involves a lot of completing the square)***. Then 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.** *(Page 595, Example #4)*

28. $4x^2 + 7y^2 + 32x - 56y + 148 = 0$

29. $5x^2 + 15y^2 + 40x - 60y + 65 = 0$

30. $y^2 - 4x + 6y + 29 = 0$

31. $y^2 - 4x - 10y + 13 = 0$

32. $8x^2 - 6y^2 + 48x - 24y + 0 = 0$

33. $5x^2 - 5y^2 + 20x - 40y - 85 = 0$

34. $x^2 + y^2 + 8x - 4y = -11$

35. $x^2 + y^2 - 6x - 8y = 11$

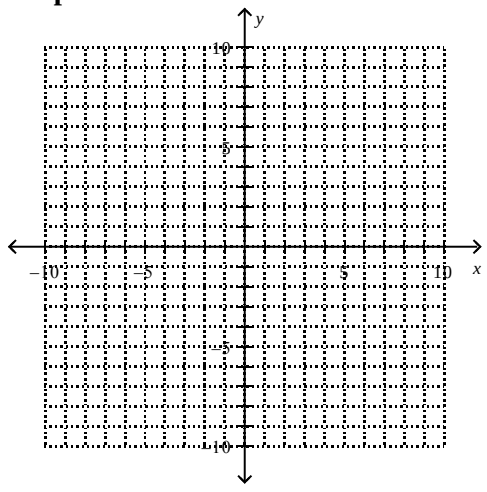
36. Graph the following system of equations: $\begin{cases} y = x - 4 \\ x^2 + y^2 = 16 \end{cases}$

Identify the system as a linear-quadratic or quadratic-quadratic system. Then name the solution(s).
[hint: the solutions will be the points of intersection]

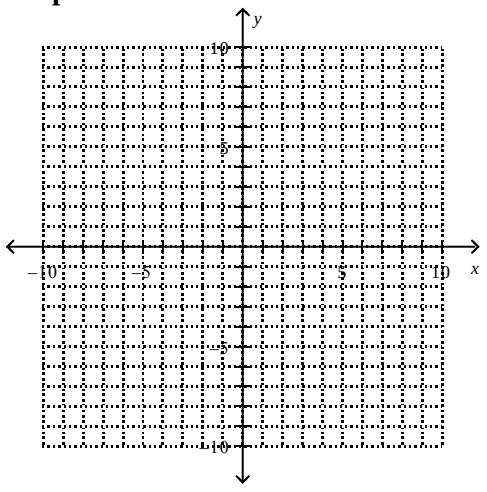
37. Graph the following system of equations: $\begin{cases} y = -x + 6 \\ x^2 + y^2 = 36 \end{cases}$

Identify the system as a linear-quadratic or quadratic-quadratic system. Then name the solution(s).

Graph for #36:



Graph for #37:



Blank Graphs for Chapter 10 Review

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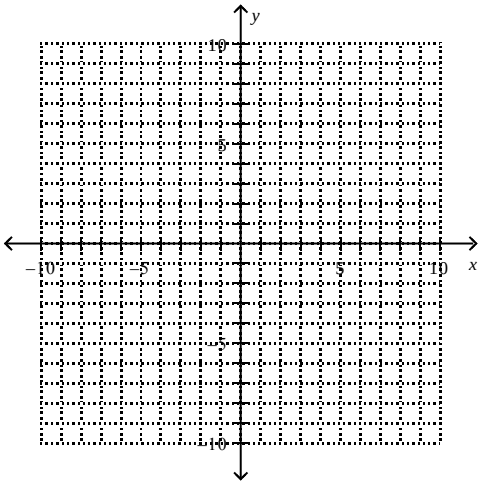

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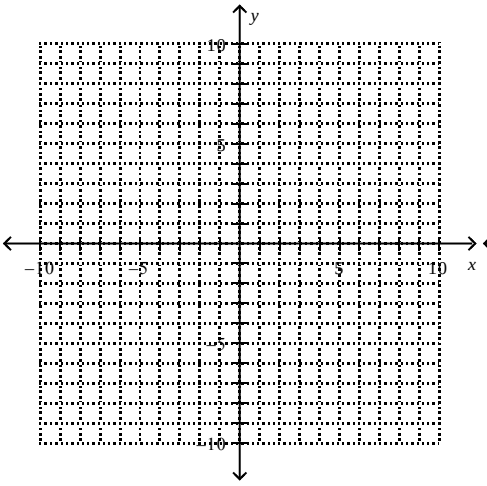

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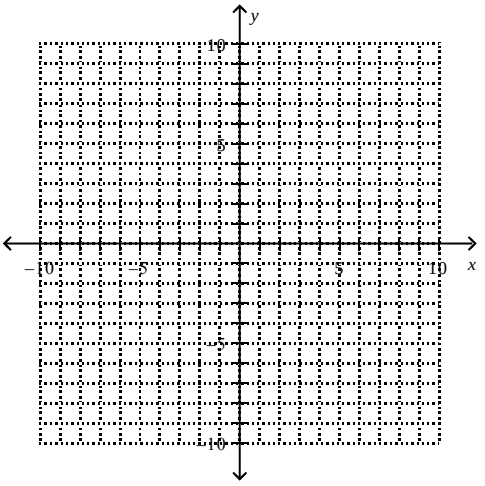

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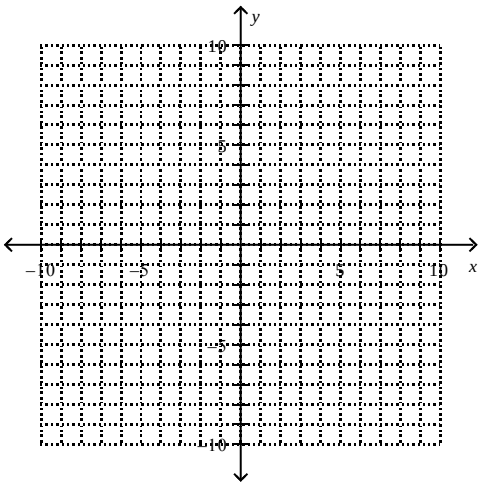

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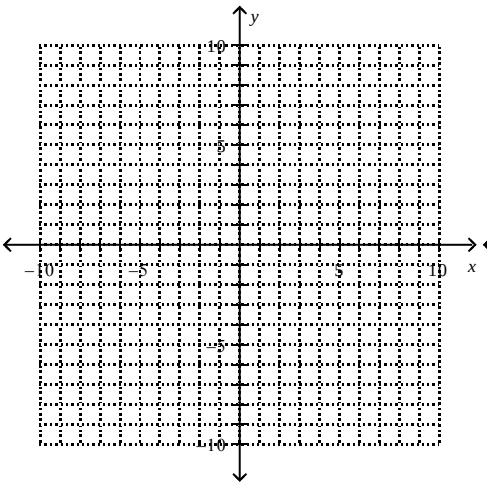

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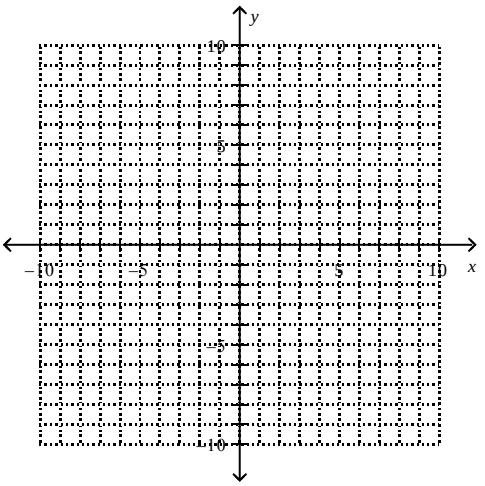

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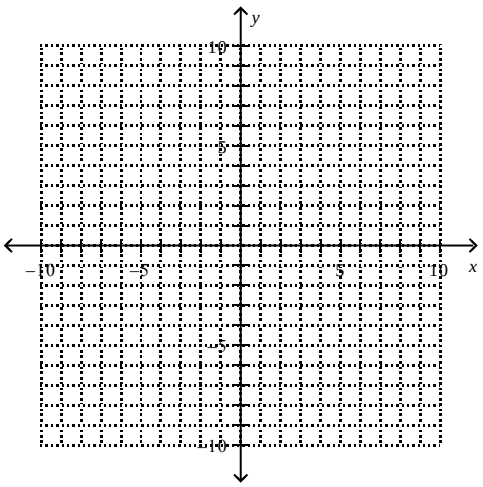

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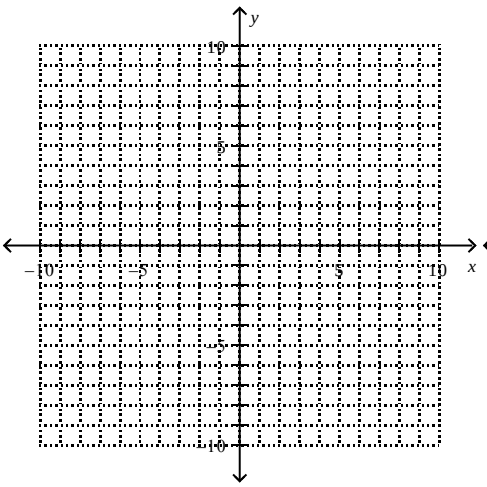

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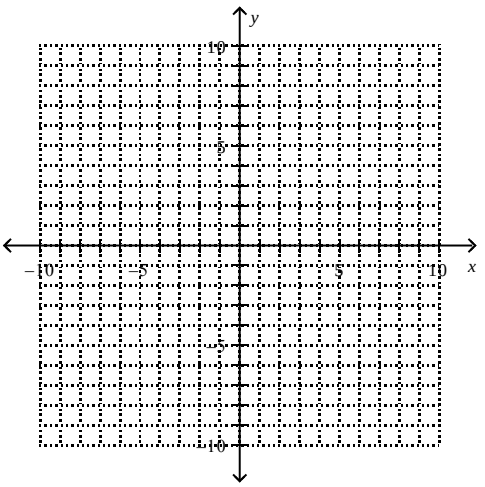


Algebra II Chapter 10 (Conic Sections) Review SOLUTIONS

(some of the graphs have been omitted to save space)

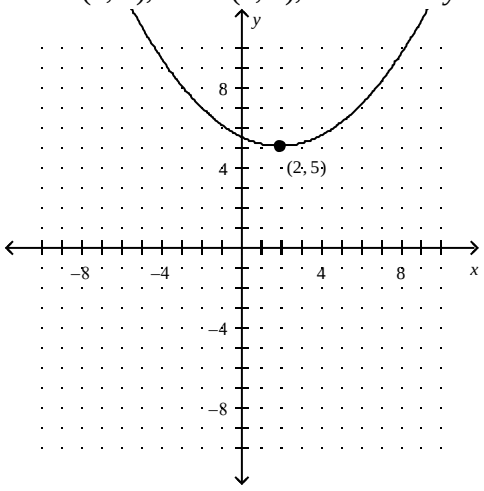
1. $x = -\frac{1}{28}y^2$ **2.** $x = -\frac{1}{12}y^2$ **3.** $x = -\frac{1}{8}y^2$ **4.** $y = -\frac{1}{28}x^2$

5. $y = -\frac{1}{20}x^2$ **6.** $y = \frac{1}{28}x^2$

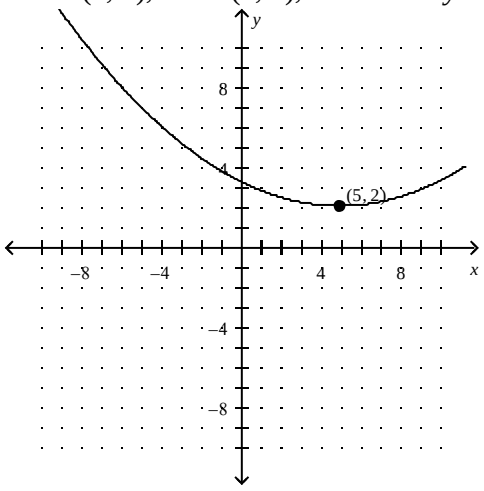
7. focus (0, –3), directrix at $y = 3$

8. focus (2, 0), directrix at $x = –2$

9. vertex (2, 5), focus (2, 7), directrix at $y = 3$



10. vertex (5, 2), focus (5, 7), directrix at $y = –3$



11. $(x+5)^2 + (y+8)^2 = 4$

$(x-2)^2 + (y+4)^2 = 25$

12. $(x+8)^2 + (y+2)^2 = 25$

13.

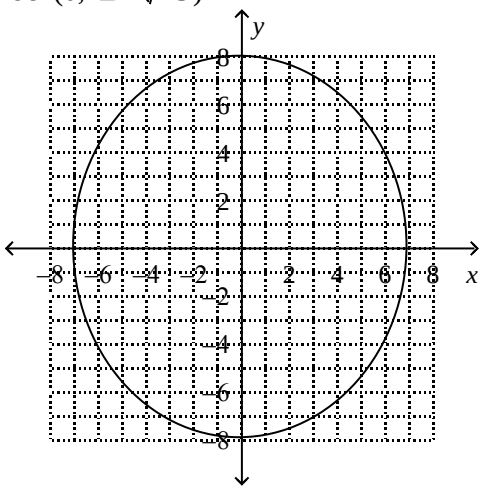
14. $(x+5)^2 + (y-7)^2 = 64$

15. Center: (-5, -3); Radius = 4

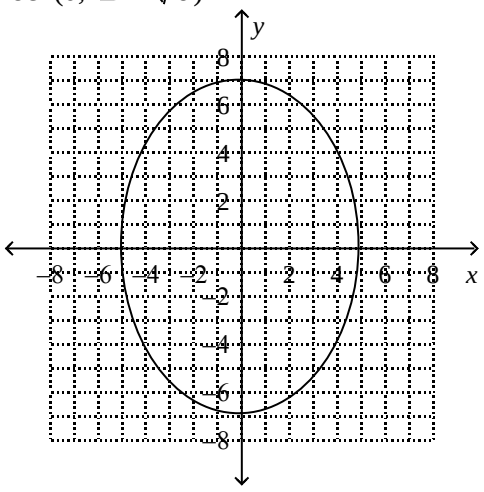
16. $\frac{x^2}{25} + \frac{y^2}{9} = 1$

17. $\frac{x^2}{4} + \frac{y^2}{16} = 1$

18. foci $(0, \pm \sqrt{15})$



19. foci $(0, \pm 2\sqrt{6})$



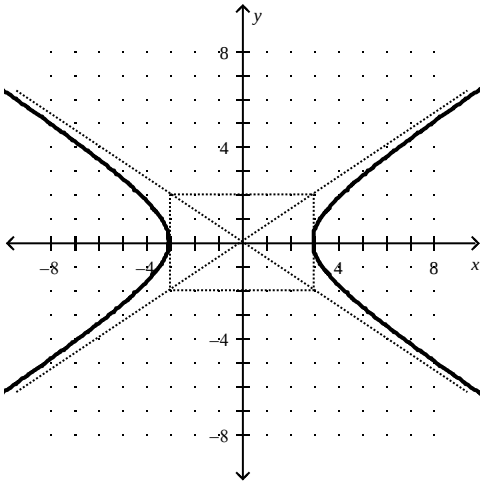
20. $\frac{(x+4)^2}{16} + \frac{(y-4)^2}{49} = 1$

21. $\frac{(x+2)^2}{16} + \frac{(y+5)^2}{25} = 1$

22. $\frac{(x+4)^2}{36} - \frac{(y+3)^2}{64} = 1$

23. $\frac{(x+2)^2}{36} - \frac{(y+4)^2}{64} = 1$

24.



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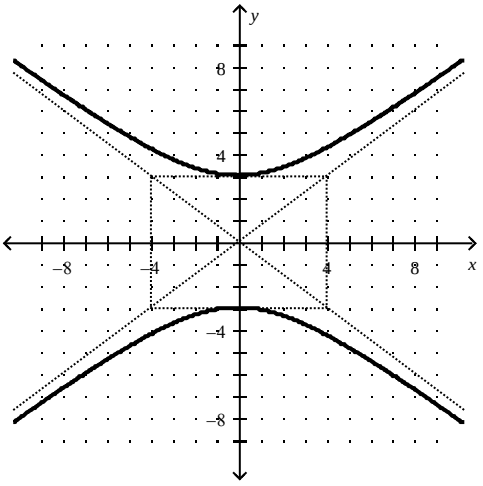

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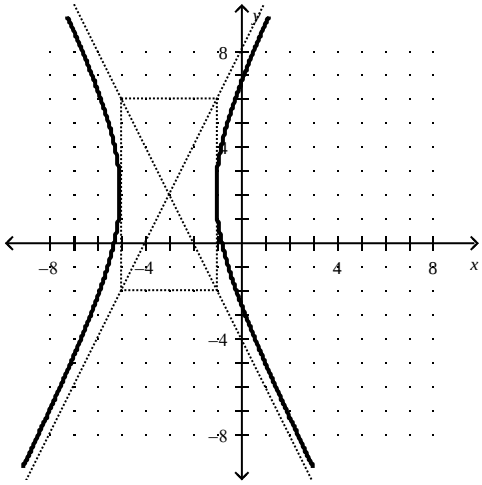

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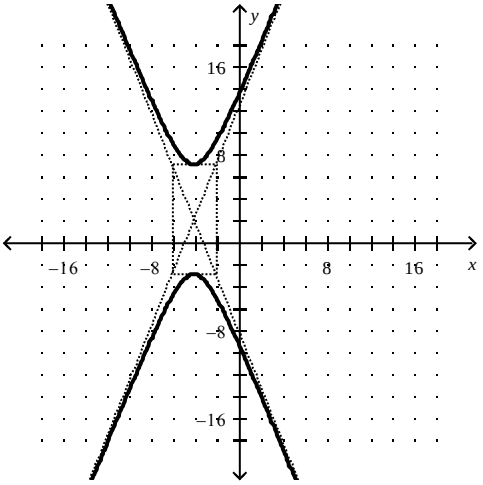

28. Standard form: $\frac{(x+4)^2}{7}+\frac{(y-4)^2}{4}=1$; ellipse with center (–4, 4), foci at $(-4 \pm \sqrt{3}, 4)$

29. Standard form: $\frac{(x+4)^2}{15}+\frac{(y-2)^2}{5}=1$; ellipse with center (–4, 2), foci at $(-4 \pm \sqrt{10}, 2)$

30. Vertex form: $x=\frac{1}{4}(y+3)^2+5$; parabola; vertex (5, –3)

31. Vertex form: $x=\frac{1}{4}(y-5)^2-3$; parabola; vertex (–3, 5)

32. Standard form: $\frac{(x+3)^2}{6}-\frac{(y+2)^2}{8}=1$; hyperbola with center (–3, –2), foci at $(-3 \pm \sqrt{14}, -2)$

33. Standard form: $\frac{(x+2)^2}{5}-\frac{(y+4)^2}{5}=1$; hyperbola with center (–2, –4), foci at $(-2 \pm \sqrt{10}, -4)$

34. Standard form: $(x+4)^2+(y-2)^2=9$; circle; center (–4, 2); radius = 3

35. Standard form: $(x-3)^2+(y-4)^2=36$; circle; center (3, 4); radius = 6

36. linear-quadratic; (0, -4), (4, 0)

37. linear-quadratic; (-6, 0), (0, 6)