Algebra 2--H

Chapter 10 Eccentricity and Review

HW # 18 1-12

Name_____

HW # 19 13-24

Solve each system algebraically:

1. $5y^2 - x^2 = 4$
   $2y = x + 3$

2. $2x^2 + 3y^2 = 24$
   $3x^2 + 2y^2 = 21$

3. Solve and graph to find the real solutions for the system $\begin{matrix} 4y^2 - 16x^2 = 16 \\ x^2 + y^2 = 4 \end{matrix}$.

4. Graph to find the area of intersection for the system: $\begin{matrix} x^2 + y^2 \le 9 \\ x \ge 2y^2 \end{matrix}$.

5. Determine the eccentricity for each of the following:
   a) $y = 2x^2 - 3$ b) $(x-1)^2 + y^2 = 7$ c) $8x^2 + 6y^2 = 48$ d) $9x^2 - 16(y+3)^2 = 144$

6. Given points P(-2, 5) and Q(4, -3). a) Find R, if Q is the midpoint of $\overline{PR}$ and b) write the equation of the perpendicular bisector of $\overline{PQ}$.

7. The distance between the points (x, 7) and (3, -5) is 15. Find all possible values of x.

8. Find the distance from the point (2, 5) to the line $3x+4y=1$.

9. Graph the parabola $x = \frac{-1}{8}y^2 - 2$. Identify and locate vertex, axis of symmetry, focus, directrix, and one other pair of points.

10. Graph the hyperbola $49(x-1)^2 = 4(y-2)^2 + 196$. Identify and locate center, vertices, foci, and asymptotes.

11. Graph the ellipse $8(x-2)^2 + 4(y+3)^2 = 16$. Identify and locate center, vertices, co-vertices, and foci. Which axis is the major axis?

12. Graph the parabola $x^2 - 4x - y + 8 = 0$. Rewrite in vertex form, identify and locate vertex, axis of symmetry, focus, and directrix.

13. Write the equation of a circle that has center (-2, -5) and passes through (4, -3).
14. Write the equation of an ellipse with foci (9, -2) and (-3, -2) and major axis length 18.
15. Write the equation of a hyperbola with vertices (5, 4) and (5, -4) and foci (5, 6) and (5, -6).
16. Write the equation of a line that is tangent to the circle $x^2 + y^2 = 25$ at (-3, -4).

17. Write the equation of a parabola that opens to the right, has vertex (4, -3), and passes through (12, -1).

18. Write the equation of a parabola with directrix y = 5 and focus (-4, -1).

Identify each conic. Rewrite in standard form. Graph it. Find center, vertices, co-vertices, foci, and radius, where appropriate.

19. $4x^2 + 4y^2 - 8x + 16y - 80 = 0$ 20. $9x^2 + 25y^2 + 36x - 150y + 36 = 0$

21. $y^2 - 3x^2 - 6x - 4y - 8 = 0$

22. Graph the parabola $3y^2 + 12y - 4x + 24 = 0$. Rewrite in vertex form. Identify and locate vertex, axis of symmetry, focus, and directrix.

23. Determine the eccentricity, rounded to the nearest tenth:

a) $4x^2 + 4y^2 = 12$ b) $9y^2 - (x-1)^2 = 9$ c) $9x^2 + (y-1)^2 = 9$ d) $y^2 - 9y - x = 0$

24. Write the equation of an ellipse with eccentricity .8 and vertices (3, -1) and (3, -11).

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Answers: 1. (-1, 1) (-29, -13) 2. $(\sqrt{3}, \pm\sqrt{6})$ $(-\sqrt{3}, \pm\sqrt{6})$ 3. $(0, \pm 2)$ 5a) 1 b) 0 c) .5 d) 1.25 6a) (10, -11) b) $y = \frac{3}{4}x + \frac{1}{4}$ 7. 12 or -6 8. 5 9. vertex (-2, 0), axis of symmetry y = 0, focus (-4, 0), directrix x = 0 10. center (1, 2); vertices (3, 2), (-1, 2); foci (8.3, 2), (-6.3, 2); asymptotes $y = \frac{7}{2}x - \frac{3}{2}$, $y = \frac{-7}{2}x + \frac{11}{2}$ 11. center (2, -3); vertices (2, -1), (2, -5); co-vertices (3.4, -3), (.6, -3); foci (2, -4.4), (2, -1.6); y-axis is major axis
12. $y = (x-2)^2 + 4$; vertex (2, 4); axis of symmetry x = 2; focus (2, 4.25); directrix y = 3.75

13. $(x+2)^2 + (y+5)^2 = 40$ 14. $\frac{(x-3)^2}{81} + \frac{(y+2)^2}{45} = 1$ 15. $\frac{y^2}{16} - \frac{(x-5)^2}{20} = 1$

16. $y = \frac{3}{4}x - \frac{25}{4}$ 17. $x = 2(y+3)^2 + 4$ 18. $y = \frac{-1}{12}(x+4)^2 + 2$ 19. circle, $(x-1)^2 + (y+2)^2 = 25$, center (1, -2), r = 5 20. ellipse, $\frac{(x+2)^2}{25} + \frac{(y-3)^2}{9} = 1$, center (-2, 3), vertices (-7, 3) (3, 3); co-vertices(-2, 6) (-2, 0); foci (2, 3), (-6, 3) 21. hyperbola, $\frac{(y-2)^2}{9} - \frac{(x+1)^2}{3} = 1$, center (-1, 2), vertices (-1, 5) (-1, -1); foci (-1, 5.5) (-1, -1.5)

22. $x = \frac{3}{4}(y+2)^2 + 3$, vertex (3, -2), axis of symmetry y = -2, focus $\left(3\frac{1}{3}, -2\right)$, directrix $x = 2\frac{2}{3}$

23. a) 0 b) 3.2 c) .9 d) 1 24. $\frac{(x-3)^2}{9} + \frac{(y+6)^2}{25} = 1$