Algebra II Chapter 9 Review 2015

Name: Key Date: Period:

ead each problem carefully. In order to receive full credit, you must show ALL work.

1. Find the distance between the two points. Then, find the midpoint of the line segment connecting the two points. (8, -5) (3, 4)

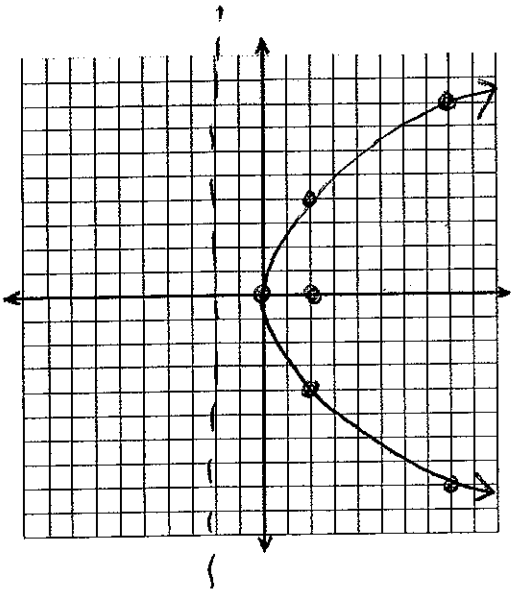
a) $\sqrt{(8-3)^2+(-5-4)^2} = \sqrt{25+81} = \sqrt{106}$ b) $\left(\frac{8+3}{2}, \frac{-5+4}{2}\right) = \left(\frac{11}{2}, -\frac{1}{2}\right)$

Graph each equation.

2. $y^2 = 8x$ $y^2 = 4px$ $4p = 8$ $p = 2$

Focus: (2, 0)

Directrix: $x = -2$ Vertex (0, 0)

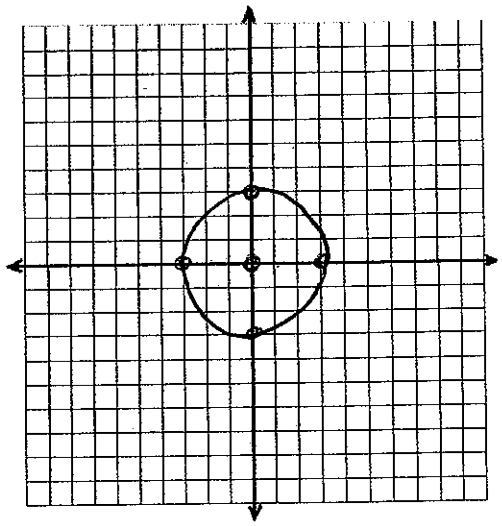


x	y
0	0
2	4, -4
8	8, -8

3. $3x^2 + 3y^2 = 27$ $x^2 + y^2 = 9$

Center: (0, 0)

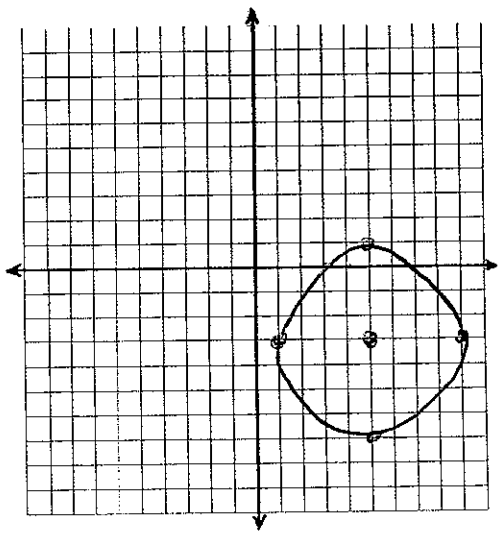
Radius: 3



4. $(x-5)^2 + (y+3)^2 = 16$

Center: (5, -3)

Radius: 4



5. $\frac{16x^2}{64} + \frac{4y^2}{64} = \frac{64}{64}$ $\quad \frac{x^2}{4} + \frac{y^2}{16} = 1$

Vertices: (0,4) (0,-4)

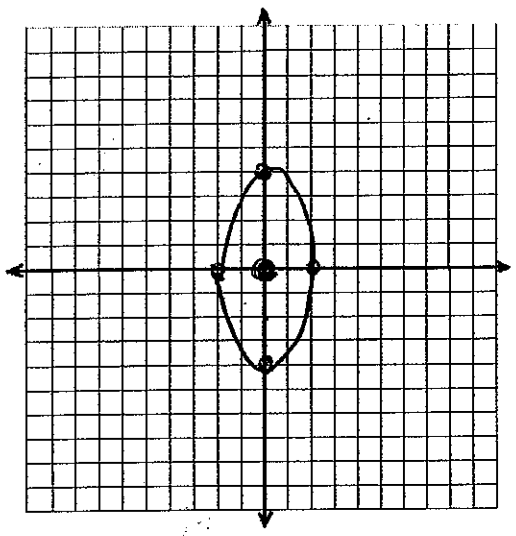
Co-vertices: (2,0) (-2,0)

Foci: $(0, 2\sqrt{3})$ $(0, -2\sqrt{3})$

vertical Ellipse center (0,0)

$a^2 = 16$ $a = \pm 4$

$b^2 = 4$ $b = \pm 2$



$c^2 = a^2 - b^2$

$c^2 = 16 - 4$

$c^2 = 12$

$c = \sqrt{12}$ or $2\sqrt{3}$

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

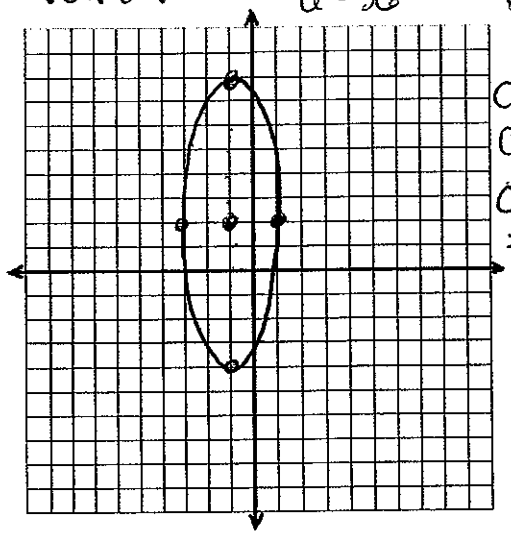
Vertices: (-1,8) (-1,-4)

Co-vertices: (1,2) (-3,2)

Foci: $(-1, 2 \pm 4\sqrt{2})$

Ellipse center (-1,2)

vertical $\quad a^2 = 36$ $\quad b^2 = 4$



$c^2 = 36 - 4$

$c^2 = 32$

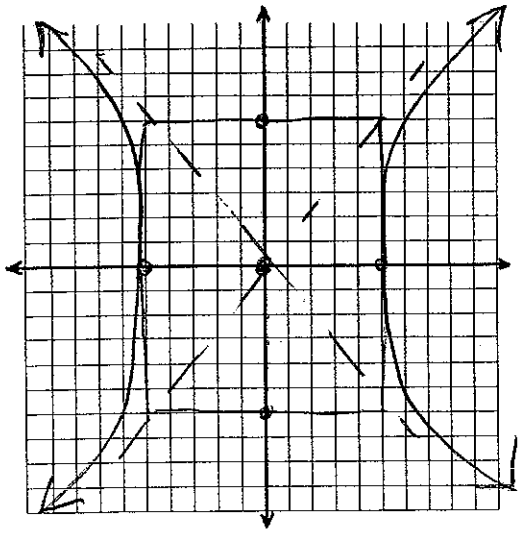
$c = \sqrt{32} = 4\sqrt{2}$

7. $\frac{x^2}{25} - \frac{y^2}{36} = 1$ $\quad a^2 = 25$ $\quad b^2 = 36$

horiz hyperbola center (0,0)

Vertices: (5,0) (-5,0)

Foci: $(\pm\sqrt{61}, 0)$



$c^2 = a^2 + b^2$

$c^2 = 25 + 36$

$c^2 = 61$

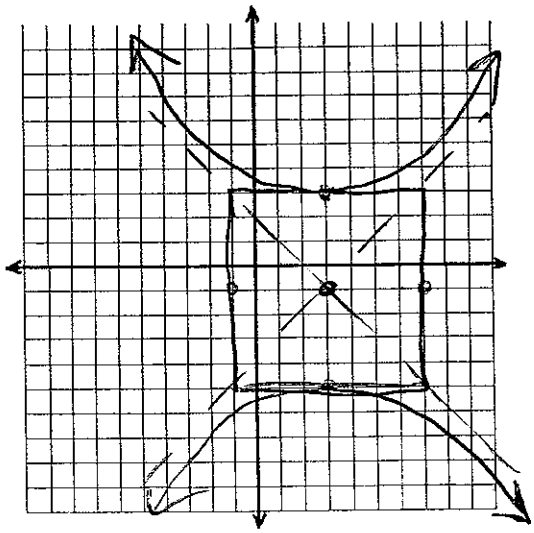
$c = \sqrt{61}$

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

Vertical hyperbola center (3,-1)

Vertices: (3,3) (3,-5)

Foci: $(3, -1 \pm 4\sqrt{2})$



$c^2 = 16 + 16$

$c^2 = 32$

$c = \sqrt{32}$ or $4\sqrt{2}$

Write an equation for each conic section.

9. Parabola with a vertex at (0, 0) and a focus and (0, 2).

opens up

$x^2 = 4py$

$x^2 = 4(2)y$ $x^2 = 8y$

10. Circle with a center at (5, -7) and radius 4.

$(x-5)^2 + (y+7)^2 = 16$

11. Ellipse with a center at (2, 4), vertex at (-4, 4) and co-vertex at (2, 1).

distance = 6

$\frac{(x-2)^2}{36} + \frac{(y-4)^2}{9} = 1$ covertex dist. = 3

12.

$\frac{(y+2)^2}{9} - \frac{(x+4)^2}{4} = 1$

Classify the conic section and write its equation in standard form.

13. $\frac{3x^2}{3} + \frac{3y^2}{3} = \frac{75}{3}$

$x^2 + y^2 = 25$ circle

14. $\frac{4x^2}{64} + \frac{16y^2}{64} = \frac{64}{64}$

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

15. $4y^2 - 36x^2 - 144 = 0$

$\frac{4y^2}{144} - \frac{36x^2}{144} = \frac{144}{144}$

$\frac{y^2}{36} - \frac{x^2}{4} = 1$ hyperbola

16. $4x^2 - 16x - y + 21 = 0$

$4(x^2 - 4x\ \ ) = y - 21$

$4(x^2 - 4x + 4) = y - 21 + 16$

$4(x-2)^2 = y - 5$

$(x-2)^2 = \frac{1}{4}(y-5)$ Parabola

17. $y^2 - 6y - 4x^2 - 8x = 95$ hyperbola

$(y^2 - 6y + 9) - 4(x^2 + 2x + 1) = 95 + 9 - 4$

$\frac{(y-3)^2}{100} - \frac{4(x+1)^2}{100} = \frac{100}{100}$

$\frac{(y-3)^2}{100} - \frac{(x+1)^2}{25} = 1$

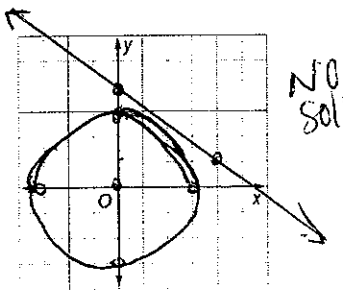
18. Solve the following system by graphing.

$y^2 = 9 - x^2$

$y = -\frac{3}{4}x + 4$

$x^2 + y^2 = 9$

circle center (0,0)



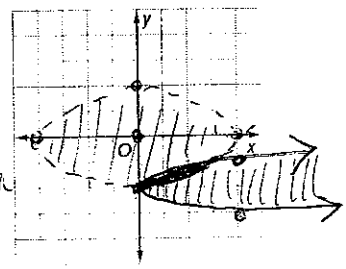
NO solution

19. Solve the system of inequalities by graphing.

$\frac{x^2}{16} + \frac{y^2}{4} < 1$

$x \geq 4(y+2)^2$

parabola vertex (0, -2) opens right



x	y
0	-2
4	-1

$\frac{x}{4} \geq (y+2)^2$

$\sqrt{\frac{x}{4}} - 2 = y$

20. Find the exact solution(s) of the system of equations algebraically.

$x^2 - 2y = 11$

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

$x^2 = 2y + 11$

$3(2y+11) + y^2 = 24$

$6y + 33 + y^2 = 24$

$-3x^2 - 6y = -33$

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

$y^2 + 6y = -9$

$y^2 + 6y + 9 = 0$

$(y+3)(y+3) = 0$

$y = -3$ (± 3)