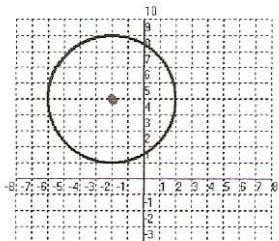


Algebra 2 Worksheet
Section 10.2-10.4 - Combo on Conics

Name: Jenay Period:

I. Write the equation (in standard form) of each conic section.

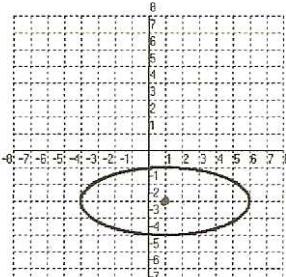
1.



center $(-2, 5)$
 $r = 4$

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

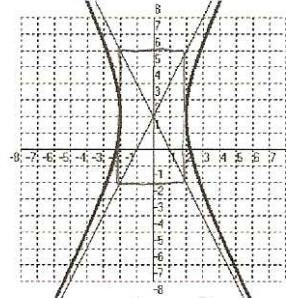
2.



center $(-1, -3)$
 $a = 5$ $b = 2$

$$\frac{(x+1)^2}{25} + \frac{(y+3)^2}{4} = 1$$

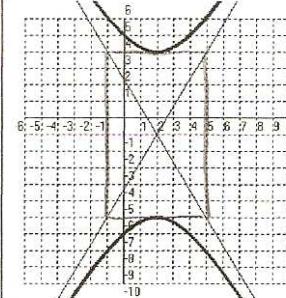
3.



center $(0, 0)$
 $a = 4$ $b = 4$

$$\frac{x^2}{16} - \frac{y^2}{16} = 1$$

4.



center $(0, 0)$
 $a = 5$ $b = 3$

$$\frac{y^2}{25} - \frac{x^2}{9} = 1$$

II. Write the equation (in standard form) of the conic section given...

5. circle with center $(0, 6)$ and passing through the point $(2, -3)$

$$(x-h)^2 + (y-k)^2 = r^2$$

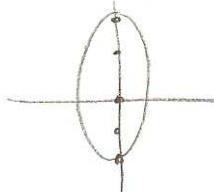
$$(2-0)^2 + (-3-6)^2 = r^2$$

$$4 + 81 = r^2$$

Standard Form of Equation:

$$(x-0)^2 + (y-6)^2 = 85$$

7. ellipse with vertices $(0, \pm 8)$ and foci $(0, \pm 6)$



$$a = 8 \quad c = 6$$

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

$$36 = 64 - b^2$$

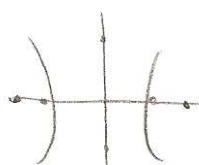
$$b^2 = 28$$

Standard Form of Equation:

$$\frac{(x-0)^2}{28} + \frac{(y-0)^2}{64} = 1$$

9. hyperbola with co-vertices $(0, \pm 5)$ and foci $(\pm 10, 0)$ $c = 10$

$$b = 5$$



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

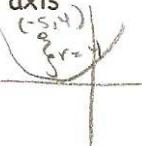
$$100 = a^2 + 25$$

$$a^2 = 75$$

Standard Form of Equation:

$$\frac{(x-0)^2}{75} - \frac{(y-0)^2}{25} = 1$$

6. circle with center $(-5, 4)$ and tangent to the x -axis



Standard Form of Equation:

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

8. ellipse with co-vertices $(0, \pm 4)$ and foci $(\pm 3, 0)$

$$b = 4 \quad c = 3$$



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

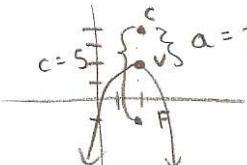
$$9 = a^2 - 16$$

$$a^2 = 25$$

Standard Form of Equation:

$$\frac{(x-0)^2}{25} + \frac{(y-0)^2}{16} = 1$$

10. hyperbola with center $(2, 4)$, vertex $(2, 2)$, and focus $(2, -1)$



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

$$25 = 4 + b^2$$

$$b^2 = 21$$

Standard Form of Equation:

$$\frac{(y-4)^2}{4} - \frac{(x-2)^2}{21} = 1$$

III. Match each equation in the first row with its correct problem number, based on identifying the conic section. Then find all the requested information. Then graph.

Equation Choices: $4(x+2)^2 + 25(y+1)^2 = 100$ $16(x-2)^2 - 9(y+3)^2 = 144$ $x^2 + y^2 - 2x + 4y = 11$

11.

CIRCLE: $x^2 + y^2 - 2x + 4y = 11$

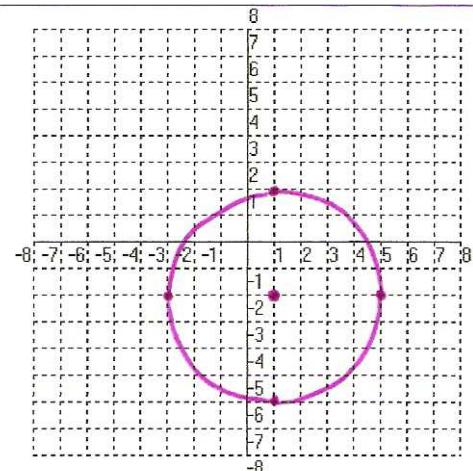
$$x^2 - 2x + \underline{1} + y^2 + 4y + \underline{4} = 11 + \underline{1} + \underline{4}$$

Standard Form of the CIRCLE:

$$(x-1)^2 + (y+2)^2 = 16$$

Center: $(\underline{1}, \underline{-2})$

Radius: $r = \underline{4}$



12.

ELLIPSE: $\frac{4(x+2)^2}{100} + \frac{25(y+1)^2}{100} = 1$

100

$a = 5$

$b = 2$

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

$c^2 = 25 - 4$

Standard Form of the ELLIPSE:

$$\frac{(x+2)^2}{25} + \frac{(y+1)^2}{4} = 1$$

$c^2 = 21$

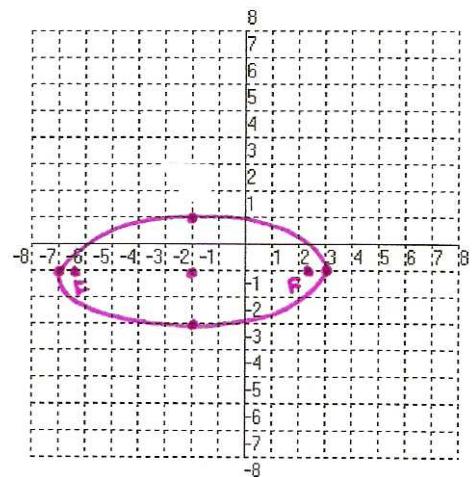
$c \approx \pm 4.6$

Center: $(\underline{-2}, \underline{-1})$

Vertices: $(\underline{3}, \underline{-1})$ & $(\underline{-7}, \underline{-1})$

Co-Vertices: $(\underline{-2}, \underline{1})$ & $(\underline{-2}, \underline{-3})$

Foci: $(\underline{2.6}, \underline{-1})$ & $(\underline{-6.6}, \underline{-1})$



13.

HYPERBOLA: $\frac{16(x-2)^2}{144} - \frac{9(y+3)^2}{144} = 1$

144

$a = 3$

$b = 4$

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

$c^2 = 9 + 16$

$c^2 = 25$

$c = \pm 5$

Standard Form of the HYPERBOLA:

$$\frac{(x-2)^2}{9} - \frac{(y+3)^2}{16} = 1$$

Center: $(\underline{2}, \underline{-3})$

Vertices: $(\underline{5}, \underline{-3})$ & $(\underline{-1}, \underline{-3})$

Co-Vertices: $(\underline{2}, \underline{1})$ & $(\underline{2}, \underline{-7})$

Foci: $(\underline{7}, \underline{-3})$ & $(\underline{-3}, \underline{-3})$

Asymptotes: $y = \pm \frac{4}{3}(x-2) - 3$

