

Name: _____
 Period: _____

Date: _____
 Pre-Calculus

Circle, Ellipse, Hyperbola and Parabola Graded Classwork

Directions: Show all work in the space provided. Graph each circle, ellipse, hyperbola and parabola neatly on graph paper and staple to this sheet.

1. Write each conic section in (h, k) form. Sketch and label each graph. If it is an ellipse or hyperbola, state whether it is vertical or horizontal, find the coordinates of its center, vertices, and foci. If it is a circle, state the center and radius. If it is a parabola, state the vertex, focus, directrix and focal width.

a. $3x^2 + 3y^2 - 10x + 12y - 8x - 30 = 6$

Circle

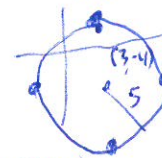
$$\frac{3x^2 + 3y^2 - 10x + 12y}{3} = \frac{36}{3}$$

$$x^2 + y^2 - 6x + 4y = 12$$

$$x^2 - 6x + 9 + y^2 + 4y + 4 = 12 + 9 + 4$$

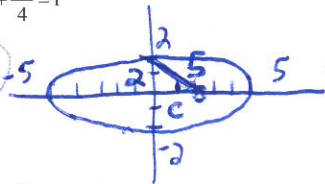
$$(x-3)^2 + (y+4)^2 = 25$$

C = (3, -4)
 R = 5



b. $\frac{x^2}{25} + \frac{y^2}{4} = 1$

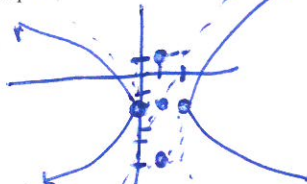
Ellipse



Horizontal Foci = $(\pm\sqrt{21}, 0)$
 C = (0,0)
 Vertices (5,0)

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

Hyperbola



Horizontal
 C = (1, -2)
 Vertices (2, -2)
 (0, -2)
 $c^2 = 1 + 9$
 $c = \sqrt{10}$
 Foci = $(1 \pm \sqrt{10}, -2)$

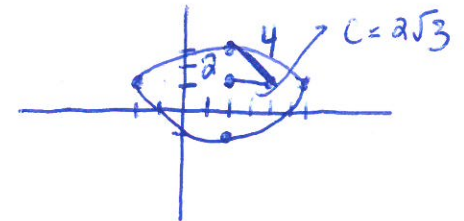
d. $x^2 + 4y^2 - 4x - 8y - 8 = 0$

Ellipse

$$x^2 - 4x + 4 + 4(y^2 - 2y + 1) = 8 + 4 + 4$$

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

Horizontal
 C = (2, 1)
 Vertices: (-2, 1) (6, 1)
 Foci: $(2 \pm 2\sqrt{3}, 1)$



e. $(y-3)^2 = -16(x-1)$

Parabola

(1, 3) vertex
 (-3, 3) focus
 X = 5 Directrix
 Focal width. 16

