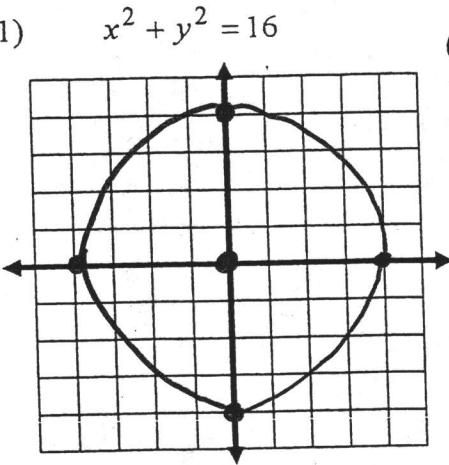


Algebra 2 Trig Honors - Conics Section Round-Up Name Key

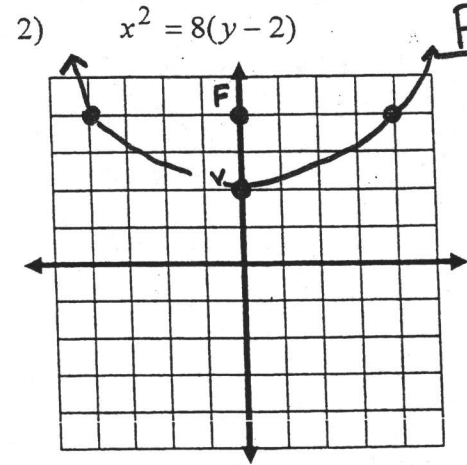


Graph the following. State the name of each conic and include the following:

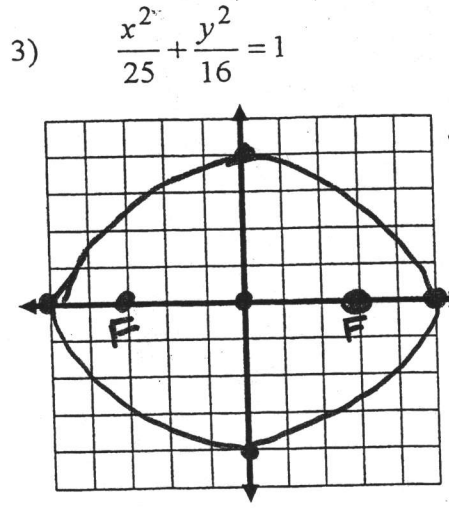
- For circles:** Center, radius, X-intercepts and Y-intercepts
- For Parabolas:** C-value, vertex, focus, directrix, focal chord length
- For Ellipses:** Center, endpoints of major and minor axes, coordinates of foci, eccentricity, focal chord length
- For Hyperbolas:** Center, vertices, coordinates of foci, eccentricity, slopes of asymptotes



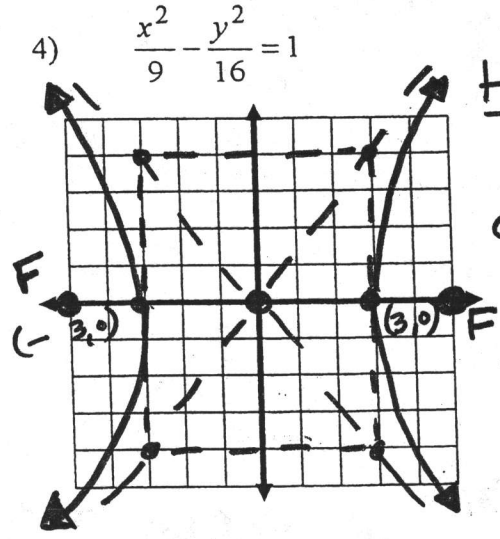
CIRCLE  
radius: 4  
center (0,0)



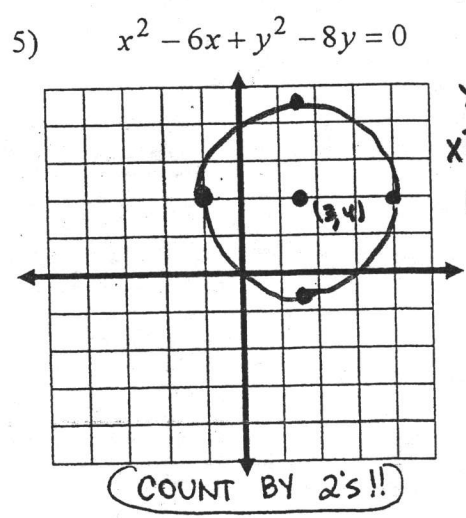
PARABOLA  
Vertex: (0,2)  
 $4p=8$   
 $p=2$



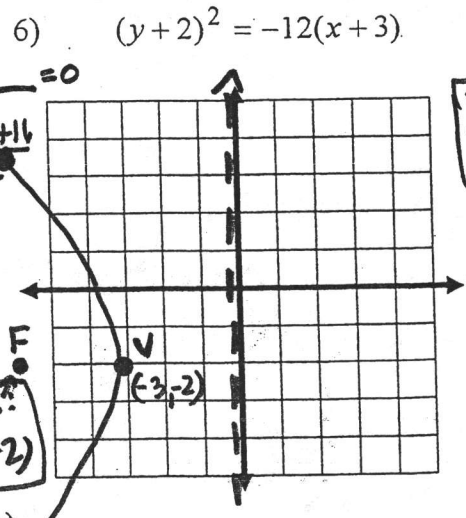
ELLIPSE  
Center (0,0)  
Foci:  
 $c^2 = a^2 - b^2$   
 $= 25 - 16$   
 $c^2 = 9$   
 $c = 3$   
(±3, 0)



HYPERBOLA  
Center (0,0)  
 $c^2 = a^2 + b^2$   
 $= 9 + 16$   
 $c^2 = 25$   
 $c = 5$   
Foci: (±5, 0)  
 $m = ±4/3$



$x^2 - 6x + \_\_ + y^2 - 8y + \_\_ = 0$   
 $x^2 - 6x + 9 + y^2 - 8y + 16 = 9 + 16$   
 $(x-3)^2 + (y-4)^2 = 25$   
CIRCLE



Vertex:  
(-3, -2)  
 $4p = 12$   
 $p = 3$

COUNT BY 2's!!

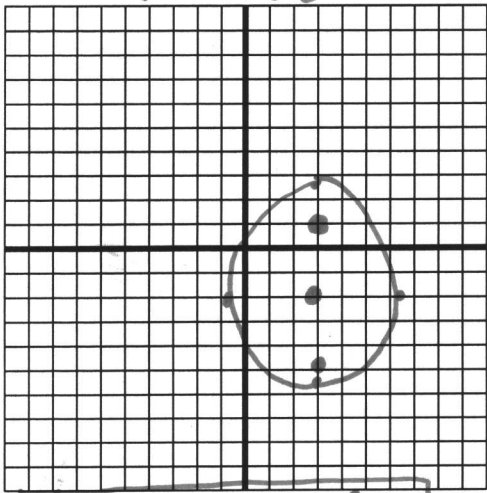
Focus: (-6, -2)

(over)

$\sqrt{x=0}$

# ELIPSE

7

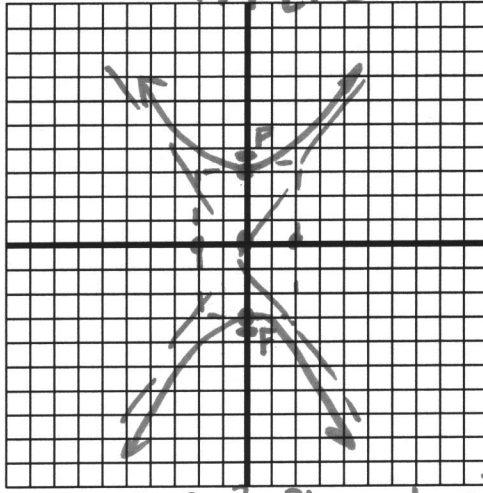


Foci:  
 $c^2 = 21 - 12$   
 $c^2 = 9$   
 $c = 3$   
 Center:  
 $(3, -2)$   
 Foci:  
 $(3, -2 \pm 3) =$   
 $(3, 1), (3, -5)$

$$\frac{(x-3)^2}{12} + \frac{(y+2)^2}{21} = 1$$

# HYPERBOLA

8

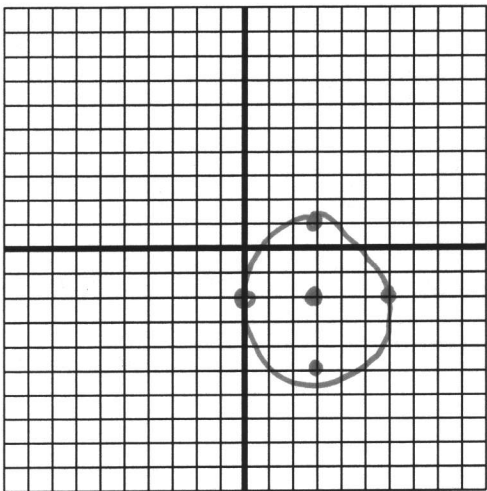


Center:  
 $(0, 0)$   
 $M = \pm \frac{3}{2}$   
 Foci:  $\sqrt{13}$   
 $c = \sqrt{13}$   
 $(0, \pm\sqrt{13})$

$$4y^2 - 9x^2 = 36 \Rightarrow \frac{y^2}{9} - \frac{x^2}{4} = 1$$

# PARABOLA

9

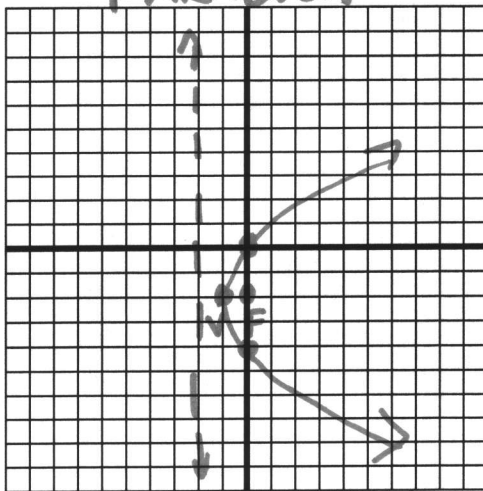


CIRCULO

$$(x-3)^2 + (y-2)^2 = 9$$

Center:  $(3, 2)$   $r = 3$

10



Vertex:  
 $(-1, -2)$   
 $4p = 4$   
 $p = 1$   
 OPENS RIGHT

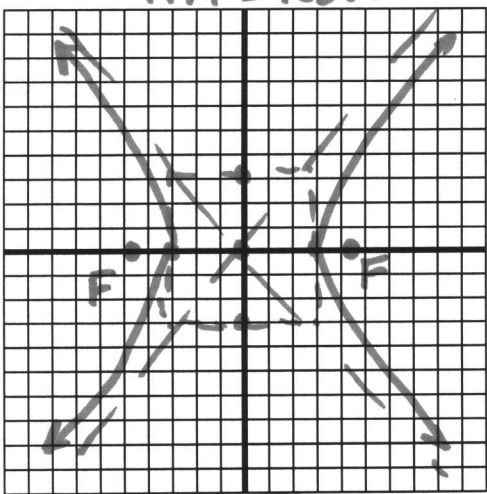
$$y^2 + 4y - 4x = 0$$

$$y^2 + 4y + 4 = 4x + 4 \Rightarrow (y+2)^2 = 4(x+1)$$

# ELIPSE

11

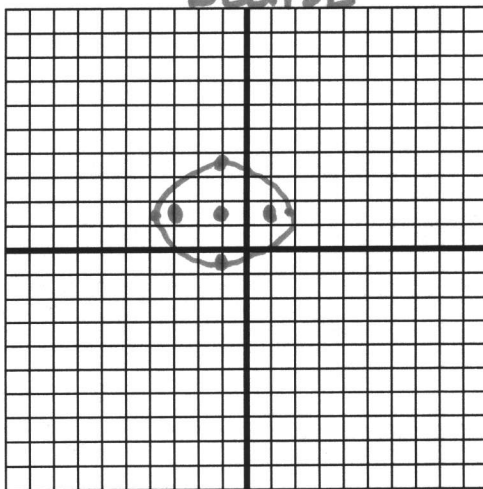
# HYPERBOLA



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

Center:  $(0, 0)$   
 $c = \sqrt{18}$  Foci  $(\pm\sqrt{18}, 0)$

12



Center:  
 $(-1, 1.5)$   
 Foci:  
 $c = 2$   
 $(-1 \pm 2, 1.5)$   
 $(1, 1.5)$  +  
 $(-3, 1.5)$

$$2x^2 + 4x + 4y^2 - 12y = 5$$

$$2(x^2 + 2x + 1) + 4(y^2 - 3y + \frac{9}{4}) = 5 + 2 + \frac{9}{1}$$

$$2(x+1)^2 + 4(y-1.5)^2 = 16$$

$$\frac{(x+1)^2}{8} + \frac{(y-1.5)^2}{4} = 1$$

**Part III: For each of the following, write an equation in standard form.**

1) Circle; center at (-4,1); radius = 7

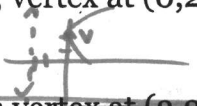
1)  $(x+4)^2 + (y-1)^2 = 49$

2) Circle; center at (2,5); contains (5,9)

$r = \sqrt{9+16} = 5$  (Use distance formula)

2)  $(x-2)^2 + (y-5)^2 = 25$

3) Parabola; vertex at (0,2); Directrix  $x = -2$



3)  $(y-2)^2 = 8(x-0)$

4) Parabola; vertex at (3,2); opens down, contains (1, -1)

4)  ~~$(x-3)^2 = -4(y-2)$~~

5) Ellipse; foci at (6,0) and (-6,0); minor axis length = 16

Horizontal Ellipse

$c=6$   
 $b=8$

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

$36 + 64 = a^2$

$a = 10$

5)  $\frac{x^2}{100} + \frac{y^2}{64} = 1$

6) Ellipse; foci at (0,3) and (0,-3); endpoints of major axis (0,5) and (0,-5)

Vertical Ellipse

$c=3$   
 $a=5$

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

$9 - 25 = -b^2$

$-16 = -b^2$   $b^2 = 16$

6)  $\frac{x^2}{16} + \frac{y^2}{25} = 1$

7) Hyperbola; foci at (13,0) and (-13,0); transverse axis length = 24

$2a = 24$   
 $a = 12$

$c = 13$

OPENS Left + Right

$169 = 144 + b^2$   $b^2 = 25$

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

7)  $\frac{x^2}{144} - \frac{y^2}{25} = 1$

8) Hyperbola; vertices (4,1) and (-4,1); ends of transverse axis at (0,4) and (0,-2)

Center: (0,1)



$b = 4$   
 $a = 3$

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

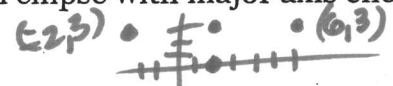
$c^2 = 9 + 16$   $c = 5$

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

**Part IV: Write parametric equations for each of the following.**

1) An ellipse with major axis endpoints of (6,3), (-2,3) and minor axis endpoints of (2,6), (2,0).

Center: (2,3)  
 $a=4$   
 $b=3$



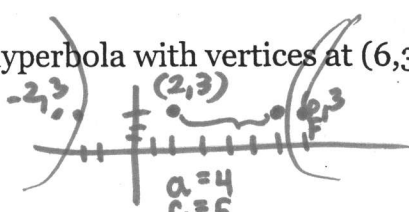
$X = 2 + 4 \cos t$   $Y = 3 + 3 \sin t$

2) An ellipse with standard equation  $\frac{(x+3)^2}{5} + \frac{(y-2)^2}{12} = 1$

$X = -3 + \sqrt{5} \cos t$   $Y = 2 + \sqrt{12} \sin t$

3) A hyperbola with vertices at (6,3), (-2,3) and foci at (7,3), (-3,3).

$c^2 = a^2 + b^2$   
 $25 - 16 = b^2$   
 $b^2 = 9$



$X = 2 + 4 \sec t$   $Y = 3 + 3 \tan t$

4) A hyperbola with standard equation  $-\frac{(x-3)^2}{16} + \frac{(y+2)^2}{9} = 1$

$X = 3 + 4 \tan t$   $Y = -2 + 3 \sec t$

5) A circle that is tangent to the x-axis at (5,0) and the y-axis at (0,5).

$r=5$  Center: (5,5)

$X = 5 + 5 \cos t$   $Y = 5 + 5 \sin t$

