

**9PT** Conic Sections Practice Test

Writing equations & identifying critical info

1. Write the equation for each of the following.

- a. A parabola with focus  $(-4, -9)$  and directrix  $x = 6$ .  $d = 10, p = 5$

$$(y+9)^2 = -20(x-1)$$

- b. A circle with endpoints of the diameter  $(-7, -3)$  and  $(-5, 5)$ . Midpoint  $(-6, 1)$

$$(x+6)^2 + (y-1)^2 = 17$$

$$1^2 + 4^2 = c^2$$

$$c = \sqrt{17}$$

- c. An ellipse with center  $(-1, 2)$ , focus  $(-3, 2)$ , and vertex  $(-5, 2)$ .

$$\frac{(x+1)^2}{16} + \frac{(y-2)^2}{12} = 1$$

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

$$4^2 + b^2 = 2^2$$

$$16 + b^2 = 4$$

$$b^2 = 12$$

- d. An ellipse with foci  $(2, 3)$  and  $(2, 7)$  and minor axis of length 6.

$$\frac{(x-2)^2}{9} + \frac{(y-5)^2}{13} = 1$$

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

$$a^2 - 9 = 4$$

$$a^2 = 13$$

- e. A hyperbola with vertices  $(2, 9)$  and  $(2, 3)$ , and foci  $(2, 10)$  and  $(2, 2)$ .

$$\frac{(y-6)^2}{9} - \frac{(x-2)^2}{7} = 1$$

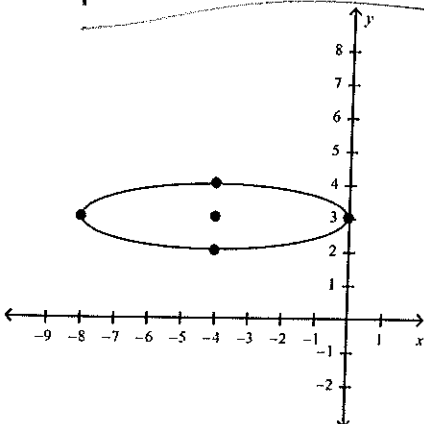
$$a^2 + b^2 = c^2$$

$$9 + b^2 = 16$$

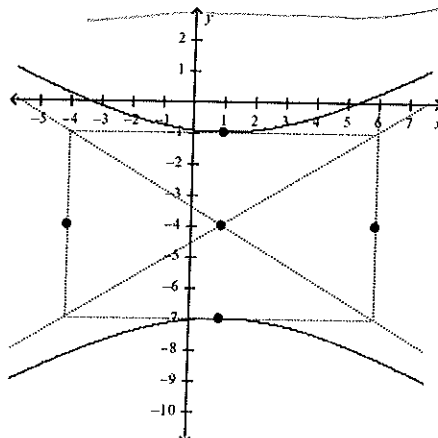
$$b^2 = 7$$

2. Write the equation of the conic section, given the graph:

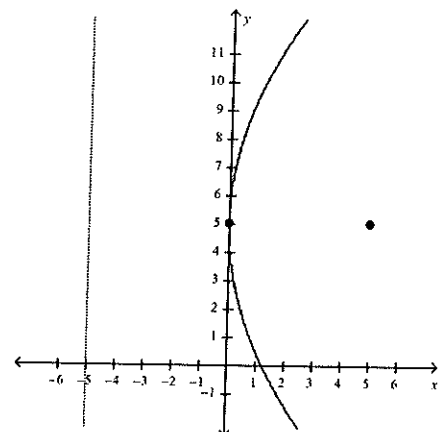
a.  $\frac{(x+4)^2}{16} + (y-3)^2 = 1$



b.  $\frac{(y+4)^2}{9} - \frac{(x-1)^2}{25} = 1$

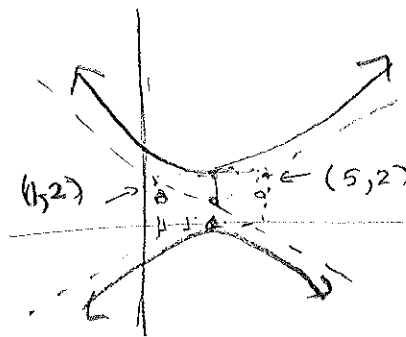


c.  $(y-5)^2 = 20x$



3. Give the critical info, according to the conic

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



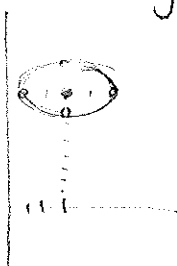
$a^2 + b^2 = c^2$   
 $1 + 4 = c^2$   
 $c = \sqrt{5}$

Left/Right Up/Down Center: (3, 1) TA length: 2 CA length: 4

Vertices: (3, 0) (3, 2) Covertices: (1, 1) (5, 1)

Foci: (3, 1 + \sqrt{5}) (3, 1 - \sqrt{5}) Asymptotes:  $y = 1/2x - 1/2$  slope =  $1/2$   
 $y = -1/2x + 5/2$   $(y-2) = 1/2(x-5)$   
 $(y-2) = -1/2(x-1)$

b.  $\frac{(x-3)^2}{4} + (y-8)^2 = 1$

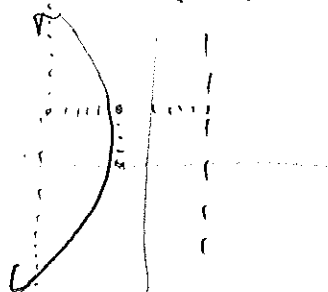


$a^2 - b^2 = c^2$   
 $4 - 1 = c^2$   $c = \sqrt{3}$

Horizontal Vertical Center: (3, 8) Maj. Axis length: 4 Min. Axis length: 2

Vertices: (1, 8) (5, 8) Covertices: (3, 9) (3, 7)

Foci: (3 + \sqrt{3}, 8) (3 - \sqrt{3}, 8)



c.  $(y-4)^2 = -20(x+1)$

Opens: left Focal width: 20 Vertex: (-1, 4) Focus: (-6, 4)

Points on focal width: (-6, 4) (-6, -4) Directrix:  $x = 4$  Axis of Symmetry:  $y = 4$

d.  $x^2 + y^2 + 4x + 12y + 36 = 0$

Standard Form:  $(x+2)^2 + (y+6)^2 = 4$

Center: (-2, -6) Radius: 2

