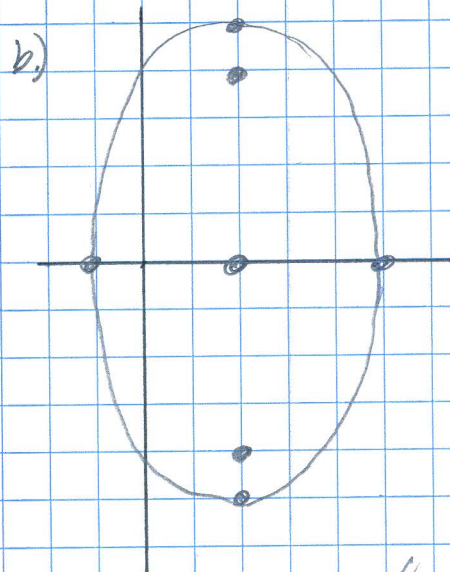
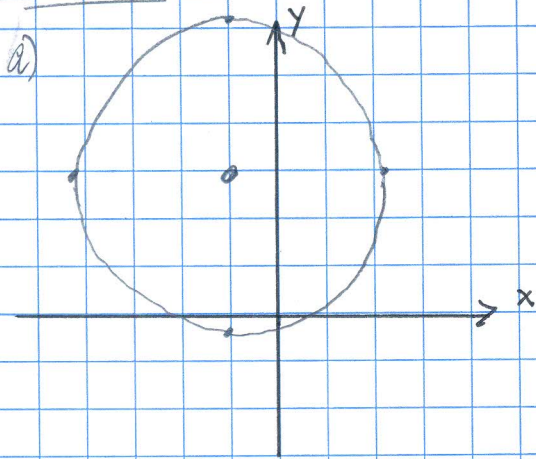


Conic Sections



$$c^2 = 25 - 9$$

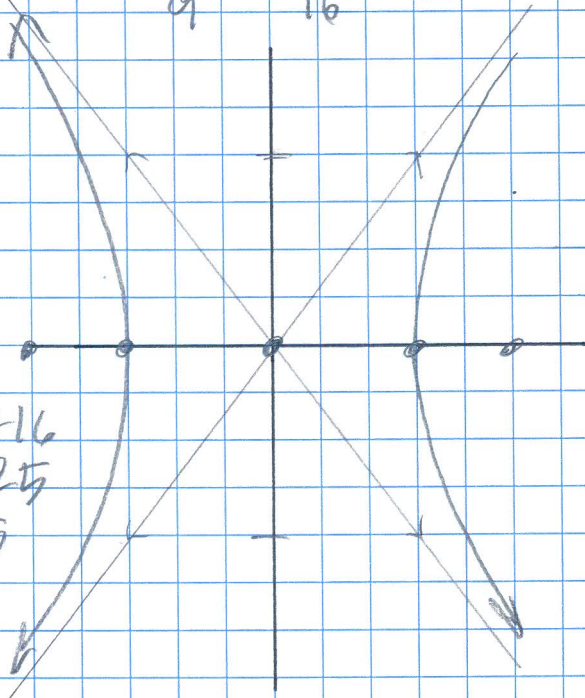
$$c^2 = 16$$

$$c = 4$$

$$\frac{16x^2 - 9y^2}{144} = \frac{144}{144}$$

c)

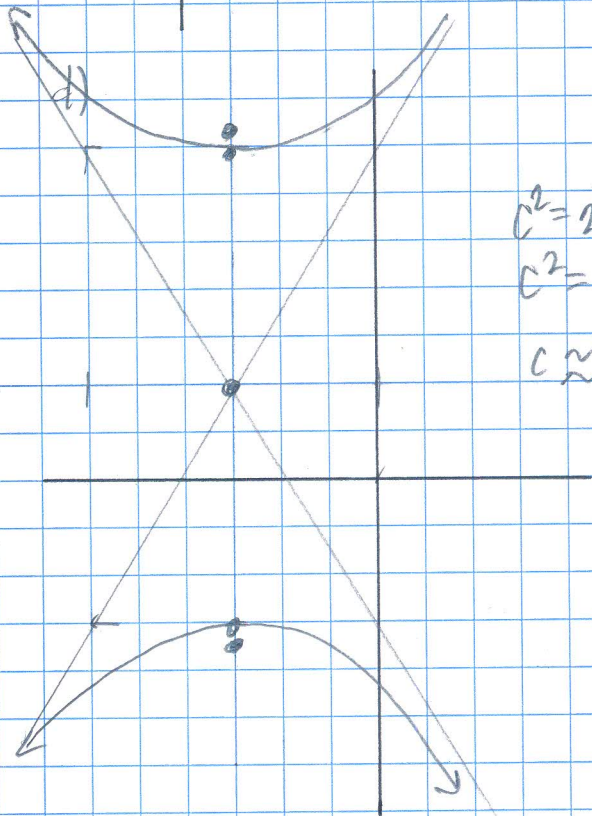
$$\frac{x^2}{9} - \frac{y^2}{16} = 1$$



$$c^2 = 9 + 16$$

$$c^2 = 25$$

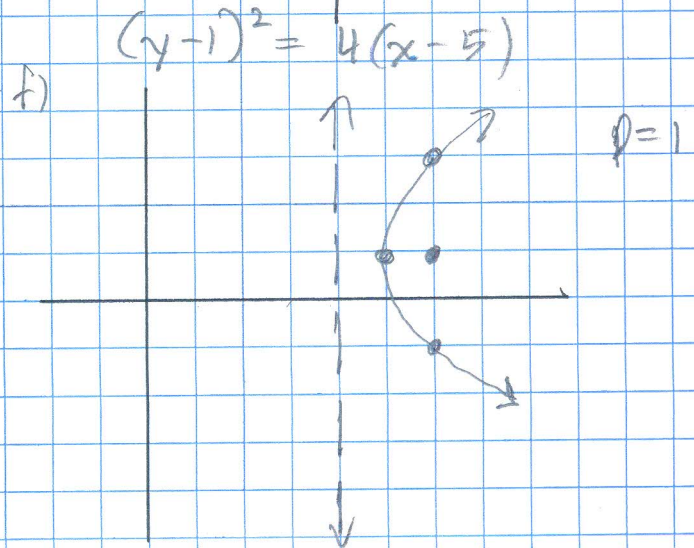
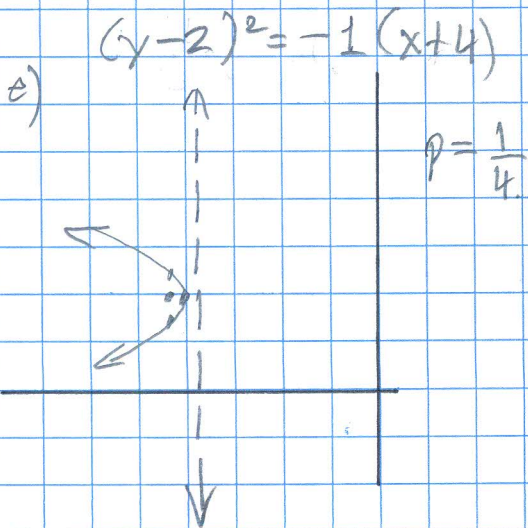
$$c = 5$$



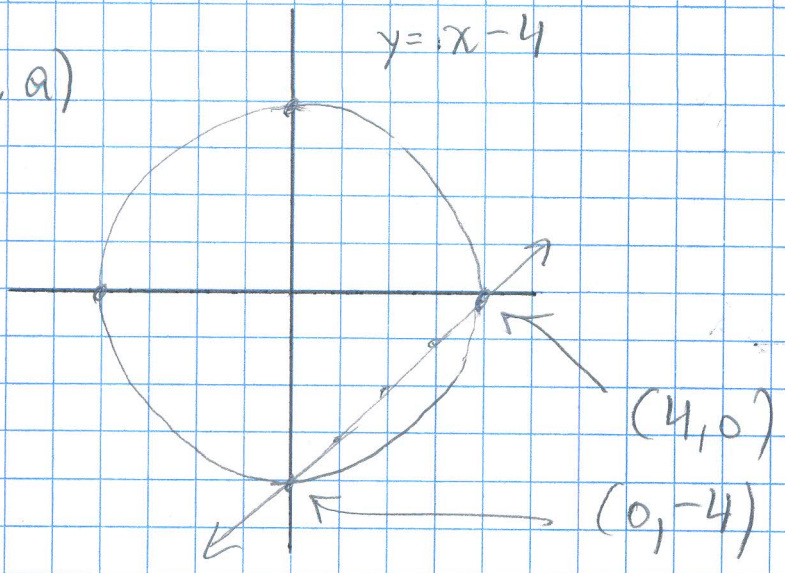
$$c^2 = 25 + 4$$

$$c^2 = 29$$

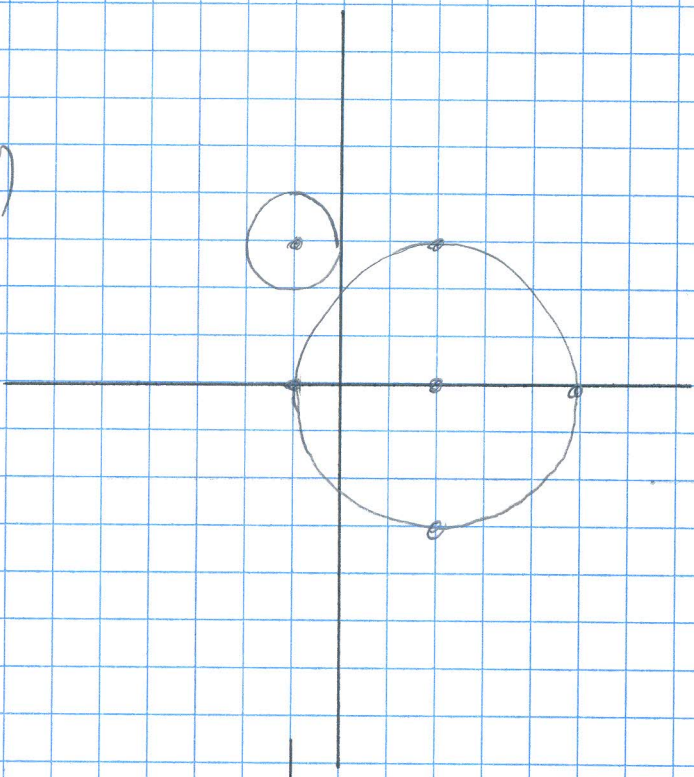
$$c \approx 5.4$$



4. a)



b)

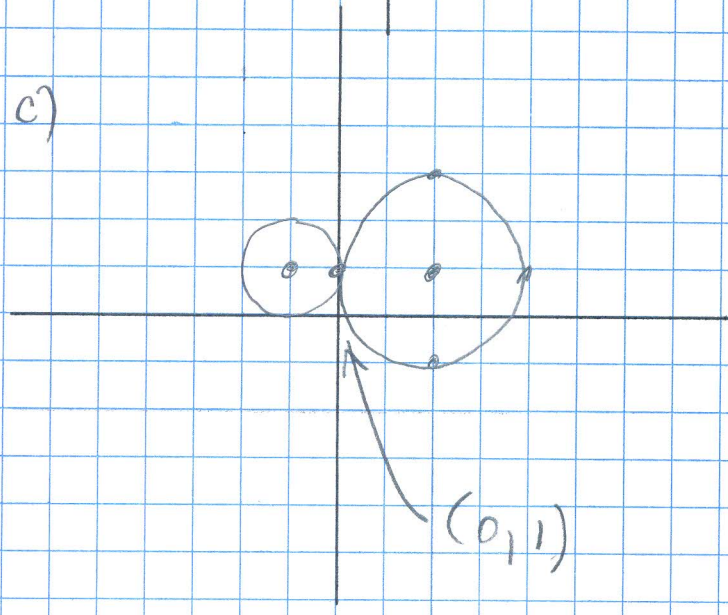


$$(x^2 - 4x + 4) + (y^2) = 5 + 4$$

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

No solution

c)



2. a) circle $(x^2 - 6x + 9) + (y^2 - 2y + 1) = -1 + 9 + 1$
 $(x-3)^2 + (y-1)^2 = 9$

b) hyperbola $6x^2 - 6y^2 = 12$
 $\frac{x^2}{2} - \frac{y^2}{2} = 1$

c) ellipse $9x^2 + 54x + 4y^2 - 16y = -61$
 $9(x^2 + 6x + 9) + 4(y^2 - 4y + 4) = -61 + 81 + 16$
 $9(x+3)^2 + 4(y-2)^2 = 36$
 $\frac{(x+3)^2}{4} + \frac{(y-2)^2}{9} = 1$

d) hyperbola $9x^2 + 36x - 4y^2 - 8y = 40$
 $9(x^2 + 4x + 4) - 4(y^2 + 2y + 1) = 40 + 36 - 4$
 $9(x+2)^2 - 4(y+1)^2 = 72$
 $\frac{(x+2)^2}{8} - \frac{(y+1)^2}{18} = 1$

e) parabola $x^2 + x + \frac{1}{4} = y + 5 + \frac{1}{4}$
 $(x + \frac{1}{2})^2 = y + \frac{21}{4}$

3. a) radius = 4
 $C = (-2, 3)$ $(x+2)^2 + (y-3)^2 = 16$

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

c) radius = $\sqrt{(2-1)^2 + (-1-4)^2} = \sqrt{26}$
 $(x-1)^2 + (y-4)^2 = 26$

d) Center = $\left(\frac{1+5}{2}, \frac{2+2}{2}\right) = (3, 2)$

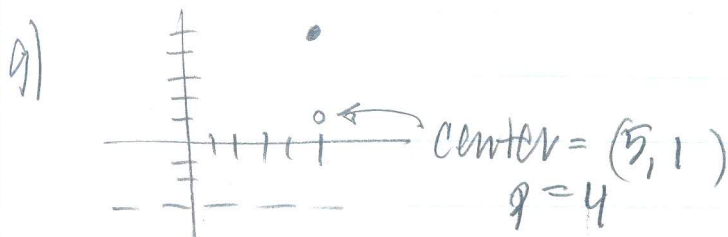
$$\frac{(x-3)^2}{4} - \frac{(y-2)^2}{9} = 1$$

e) Center = $\left(\frac{2+6}{2}, \frac{1+1}{2}\right) = (4, 1)$

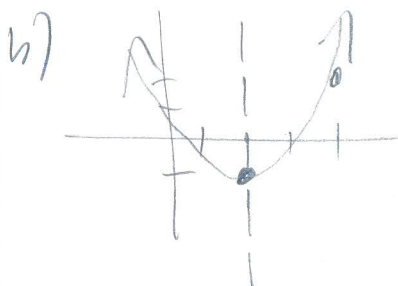
$$\frac{(x-4)^2}{4} + \frac{(y-1)^2}{1} = 1$$

f) Center = $(0, 0)$
 $c^2 = a^2 + b^2$
 $16 = 4 + b^2$
 $12 = b^2$

$$\frac{y^2}{4} - \frac{x^2}{12} = 1$$



$$(x-5)^2 = 16(y-1)$$



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

$$(4-2)^2 = 4p(2+1)$$

$$4 = 4p(3)$$

$$4 = 12p \rightarrow p = \frac{1}{3}$$

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