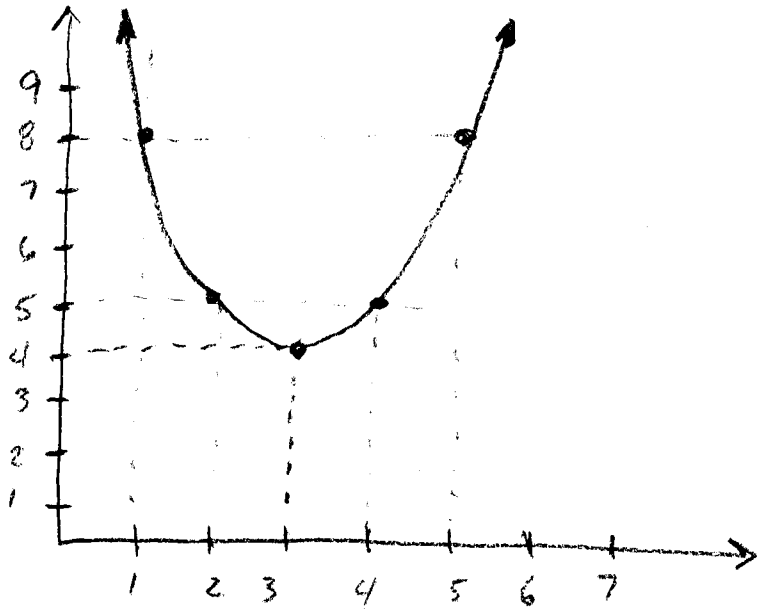
BE - Alg. 2 | Wednesday 3-17-10

① Write the vertex form of the equation of the parabola:

Use an (x, y) pair on an even grid boundary to find a.



(NS)

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

$h = 3$, $k = 4$

$y = a(x-3)^2 + 4$ Use (1, 8) (x, y)

$8 = a(1-3)^2 + 4$

$8 = a(-2)^2 + 4$

$8 = 4a + 4$

$4 = 4a$ $\therefore a = 1 \Rightarrow$ $\boxed{y = 1(x-3)^2 + 4}$

Homework Review – Pg 429-430 #20, 24, 38, 39.

(20) diameter AT $(-5, 2), (3, 6)$ $\Rightarrow$ $\boxed{(x+1)^2 + (y-4)^2 = 20}$

(24) $C(-8, -7)$ tangent to y-axis $\Rightarrow$ $\boxed{(x+8)^2 + (y+7)^2 = 64}$

(38) $x^2 + y^2 + 6y = -50 - 14x$

$\Rightarrow$ $\boxed{C(-7, -3),\ r = 2\sqrt{2}\ (\sim 2.8)}$

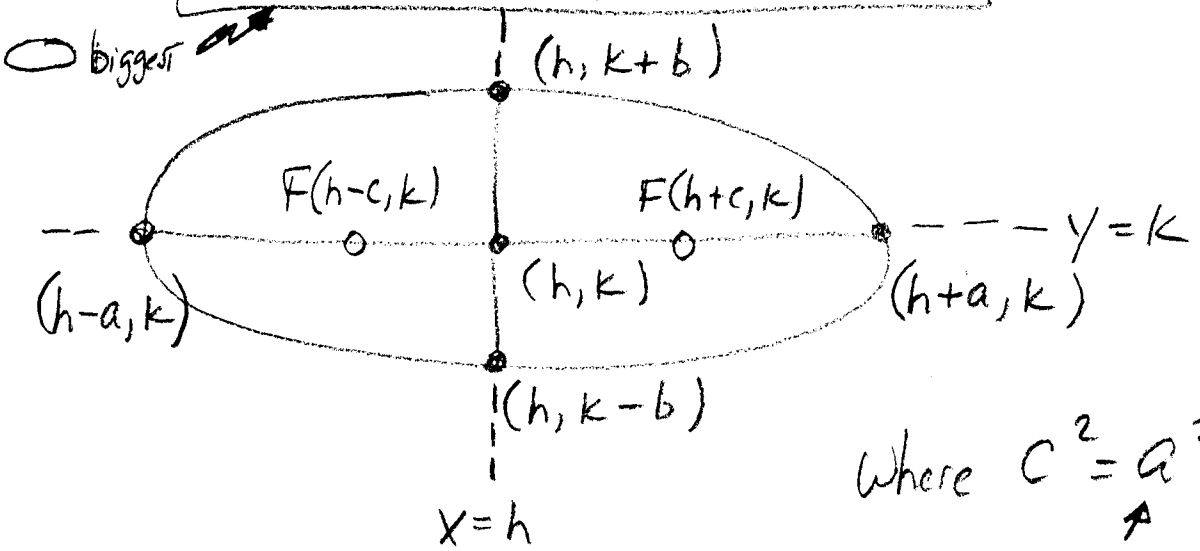
(39) $x^2 + y^2 - 6y - 16 = 0$

$\Rightarrow$ $\boxed{C(0, 3),\ r = 5}$

Recall: Ellipse $\Rightarrow$ set of ALL points in a plane such that the sum of the distances from 2 fixed points (the foci) is CONSTANT.

GRAPHING AN ELLIPSE ⇒ GET EQUATION IN STANDARD FORM FOR AN ELLIPSE ⇒

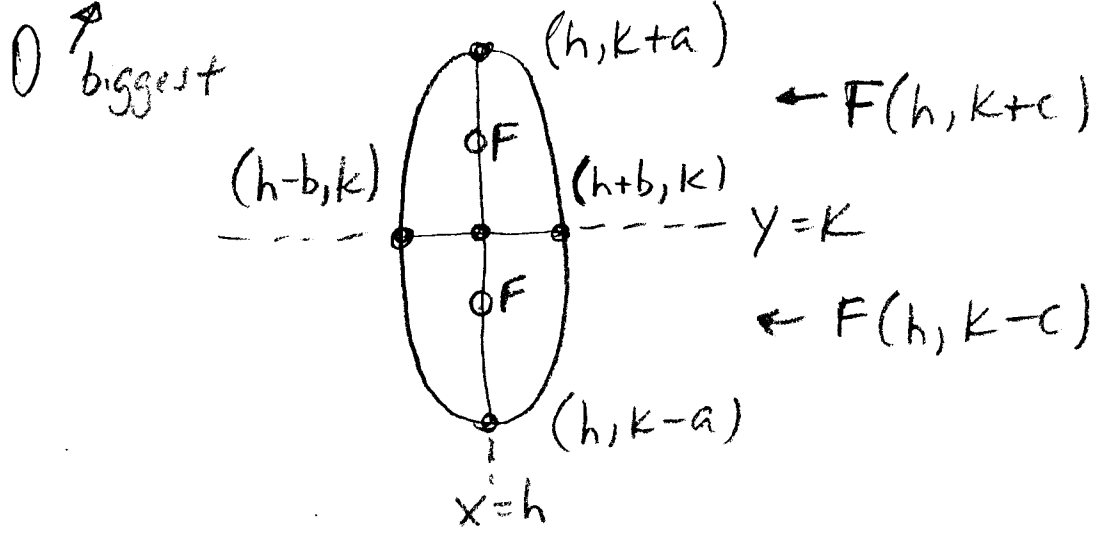
$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$



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

↑ biggest

$$\frac{(y-k)^2}{a^2} + \frac{(x-h)^2}{b^2} = 1$$



Ex 4 Pg 436 GRAPH. $x^2+4y^2+4x-24y+24=0$

$x^2+4x \quad + 4y^2-24y \quad = -24$

4.9 CAREFUL

$x^2+4x+\{2^2\} + 4(y^2-6y+\{3^2\}) = -24+\{4\}+\{36\}$

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

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

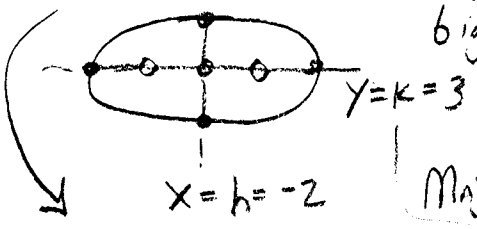
h, k

$\boxed{C(-2,3)}$

$a^2=16 \quad b^2=4$

$a=4 \quad b=2$

$c^2=a^2-b^2=12$



biggest under $(x-h)^2$ term $\Rightarrow$

LEFT-RIGHT ELLIPSE

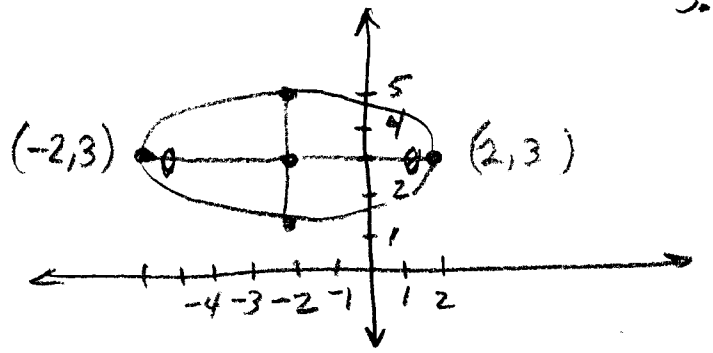
Major Axis Vertices $(h \pm a, k) = (-2 \pm 4, 3)$

$c=\sqrt{12}=\sqrt{4}\sqrt{3}=\boxed{2\sqrt{3}=c}$

Minor Axis Vertices $(h, k \pm b) = (-2, 3 \pm 2)$

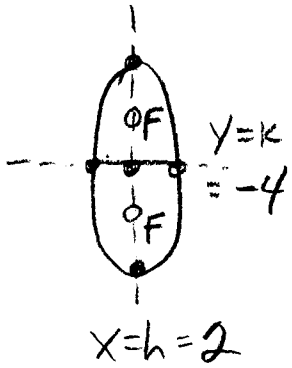
$F(h \pm c, k) = (-2 \pm 2\sqrt{3}, 3)$

~ 3.5



(Ex) GRAPH: $\frac{(y+4)^2}{25} + \frac{(x-2)^2}{9} = 1$

a^2 under $(y-k)$ term $\Rightarrow$ ⬭ up/down ellipse.



$a^2 = 25$ $a = 5$ $b^2 = 9$ $b = 3$

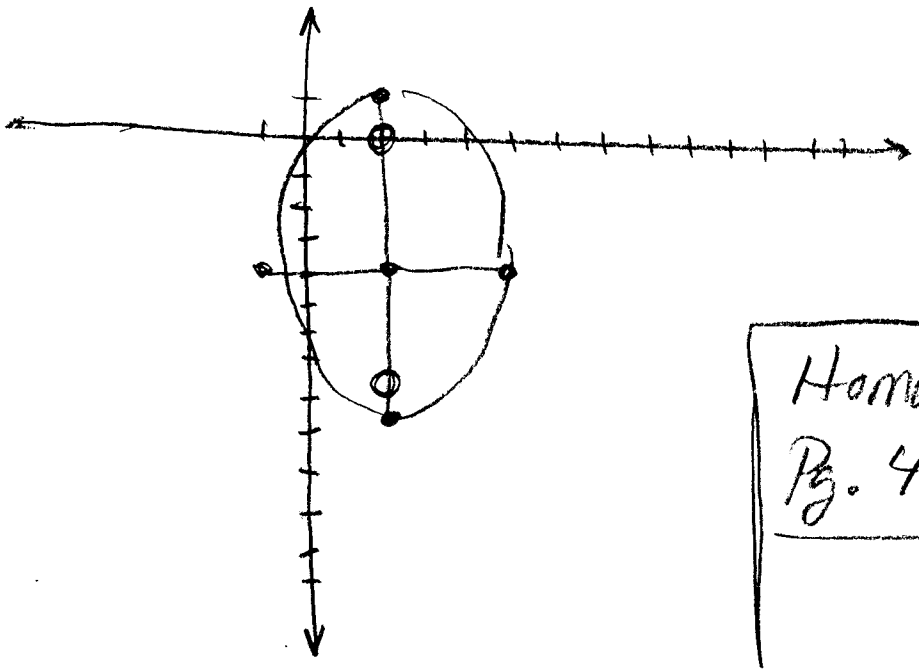
$c^2 = a^2 - b^2 = 25 - 9 = 16 \therefore c = 4$

$C(2, -4)$ WATCH OUT, Y'S ARE 1ST!
h, k

$V_{major}\ (2, -4 \pm 5) \Rightarrow (2, 1), (2, -9)$
MAJOR AXIS VERTICES

$V_{minor}\ (2 \pm 3, -4) \Rightarrow (5, -4), (-1, -4)$

$Foci\ (2, -4 \pm 4) \Rightarrow (2, 0), (2, -8)$



Homework:
Pg. 438 # 8, 10