

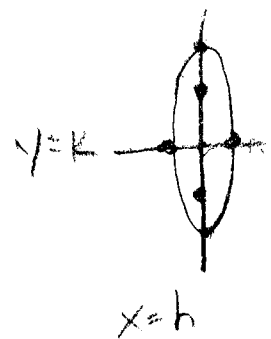
Precalc - homework review - Pg 638 # 23, 25, 27

(23) $4x^2 - 8x + y^2 + 6y = -9$

$4(x^2 - 2x + 1) + 1(y^2 + 6y + 9) = -9 + 4 + 9$

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

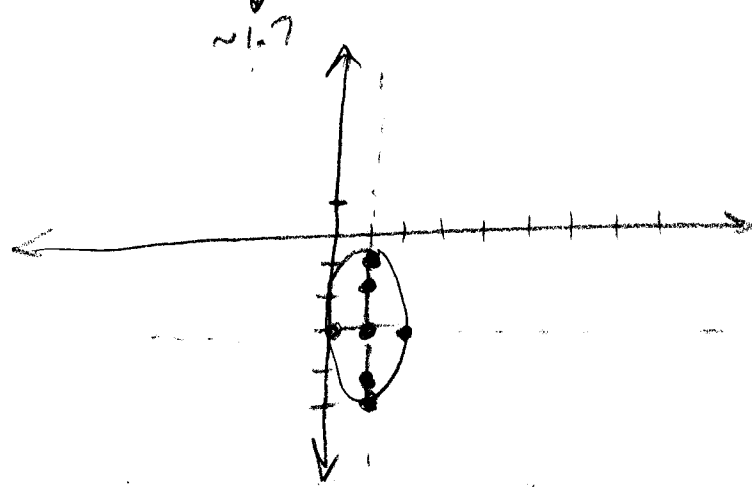
$\frac{(x-1)^2}{1} + \frac{(y+3)^2}{4} = 1$ h, k
 $C(1, -3)$



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

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

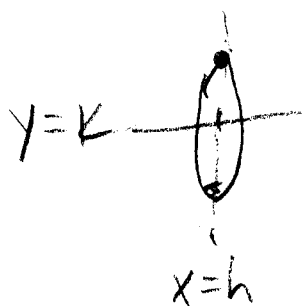
$V_{\updownarrow} = (1, -3 \pm 2) = (1, -1), (1, -5)$ MAJOR VERTICES
 $V_{\leftarrow\rightarrow} = (1 \pm 1, -3) = (2, -3), (0, -3)$ MINOR VERTICES
 $F = (1, -3 \pm \sqrt{3}) \approx (1, -1.3), (1, -4.7)$ FOCI



$$(25) \quad 3x^2 + 18x + y^2 - 2y = -4$$

$$3(x^2 + 6x + 3^2) + 1(y^2 - 2y + 1^2) = -4 + 27 + 1$$

$$\frac{3(x+3)^2}{24} + \frac{1(y-1)^2}{24} = \frac{24}{24}$$



$$\frac{(x+3)^2}{8} + \frac{(y-1)^2}{24} = 1$$

$$\frac{(y-1)^2}{24} + \frac{(x+3)^2}{8} = 1$$

$$\boxed{\begin{matrix} h, k \\ C(-3, 1) \end{matrix}}$$

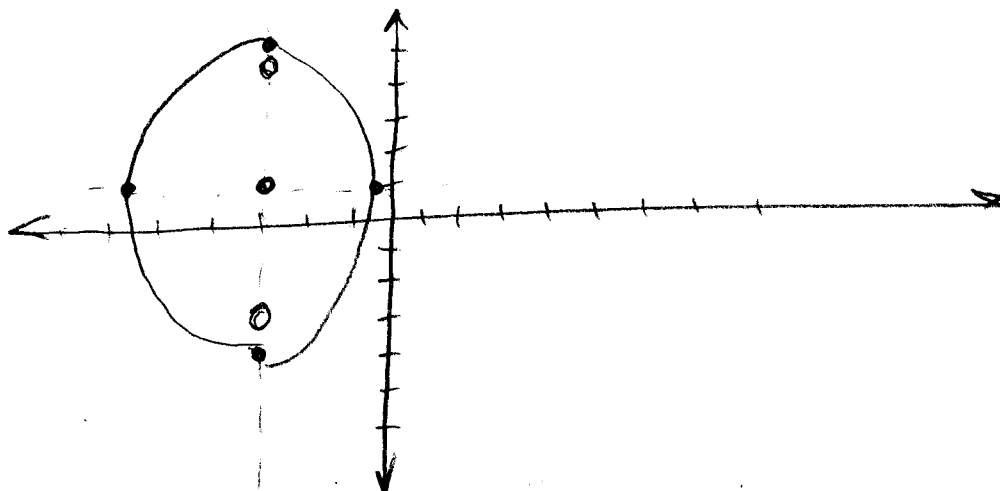
$$a = \sqrt{24} = 2\sqrt{6} \quad b = \sqrt{8} = 2\sqrt{2} \quad c^2 = a^2 - b^2$$

$$\boxed{c = 4}$$

$$V_{\updownarrow} = (-3, 1 \pm 2\sqrt{6}) = (-3, 1 \pm 4.9) = (-3, 5.9), (-3, -3.9)$$

$$V_{\leftrightarrow} = (-3 \pm 2\sqrt{2}, 1) = (-3 \pm 2.8, 1) = (-0.2, 1), (-5.8, 1)$$

$$F(-3, 1 \pm 4) \Rightarrow (-3, 5), (-3, -3)$$



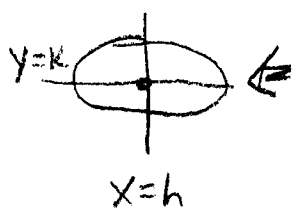
$$(27) \quad 18y^2 + 12x^2 - 144y - 48x = -120$$

$$18(y^2 - 8y + 4^2) + 12(x^2 - 4x + 2^2) = -120 + \overset{18 \cdot 6}{288} + \overset{12 \cdot 4}{48}$$

$$\frac{18(y-4)^2}{216} + \frac{12(x-2)^2}{216} = \frac{216}{216}$$

$$\frac{(y-4)^2}{12} + \frac{(x-2)^2}{18} = 1 \quad \boxed{C(2,4)}$$

h, k



$$\frac{(x-2)^2}{18} + \frac{(y-4)^2}{12} = 1$$

$$a^2 = 18, \quad a = \sqrt{18} = 3\sqrt{2}$$

$$b^2 = 12, \quad b = \sqrt{12} = 2\sqrt{3}$$

$$c^2 = a^2 - b^2 = 18 - 12 = 6 \quad \therefore c = \sqrt{6}$$

$$V_{\leftrightarrow} \Rightarrow (2 \pm 3\sqrt{2}, 4) \approx (2 \pm 4.2, 4)$$

$h \pm a, k$

$$V_{\updownarrow} \Rightarrow (2, 4 \pm 2\sqrt{3}) \approx (2, 4 \pm 3.5)$$

$h, k \pm b$

$$F_{1,2} \Rightarrow (2 \pm \sqrt{6}, 4) \approx (2 \pm 2.4, 4)$$

$h \pm c, k$

