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Quiz III

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$$Score = \frac{20}{20}$$ (11/V)

$\frac{(x+y_0)^2}{(\frac{F}{2})^2} - \frac{(x-x_0)^2}{b^2} = 1.$

QUESTION 1. (7 points) The equation of a hyperbola is $\frac{(y+3)^2}{12} - \frac{(x-2)^2}{5} = 1$

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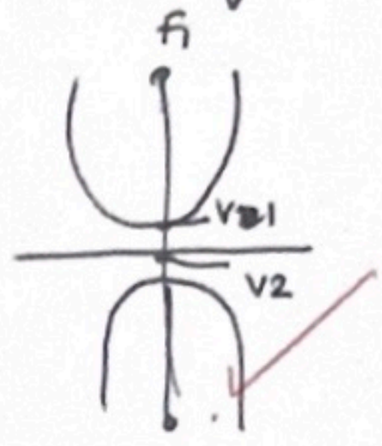
(i) Roughly, sketch the hyperbola. (on the right hand side)



(ii) Find the foci and the vertices.

$a^2 = 12$ $\quad \frac{k}{2} = 2\sqrt{3}$

$k = 4\sqrt{3}$

$c = (2, -3)$

$|V_1C| = \frac{k}{2} = 2\sqrt{3}$

$|F_1C| = \sqrt{12+5} = \sqrt{17}$

$V_1 = (2, -3+2\sqrt{3})$ $\quad F_1 = (2, -3+\sqrt{17})$

$V_2 = (2, -3-2\sqrt{3})$ $\quad F_2 = (2, -3-\sqrt{17})$

(iii) Find the constant K.

$K = 4\sqrt{3}$

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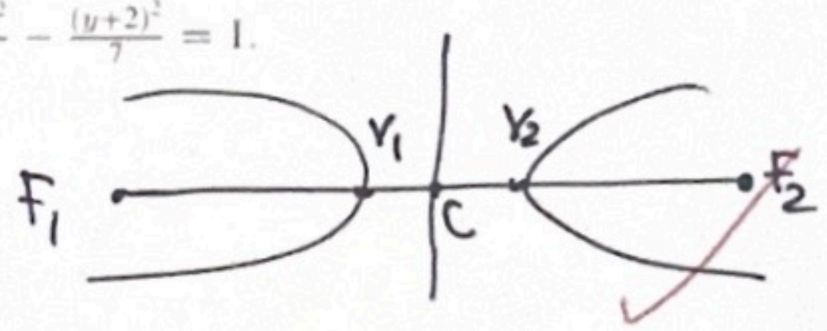
QUESTION 2. (7 points) The equation of a hyperbola is $\frac{(x-3)^2}{24} - \frac{(y+2)^2}{7} = 1.$

(i) Roughly, sketch the hyperbola. (on the right hand side)



(ii) Find the foci and the vertices.

$c = (3, -2)$

$|F_1C| = \sqrt{24+7} = \sqrt{31}$

$\left(\frac{k}{2}\right)^2 = 24$

$\frac{k}{2} = 2\sqrt{6}$

$V_1 = (3-2\sqrt{6}, -2)$ $\quad F_1 = (3-\sqrt{31}, -2)$

$V_2 = (3+2\sqrt{6}, -2)$ $\quad F_2 = (3+\sqrt{31}, -2)$

(iii) Find the constant K.

$K = 4\sqrt{6}$

QUESTION 3. (6 points) Find the parametric equations of the line that passes through $(2, -1, 6)$ and $(6, 3, 8)$. Then find the symmetric equation.

6/6

$L: t\langle \Delta x, \Delta y, \Delta z\rangle + (x_1, x_1, z)$

$\langle 4, 4, 2\rangle$

Parametric eqn

$x: 4t+2$

$y: 4t-1$

$z: 2t+6$

symmetric eqn

$\frac{x-2}{4} = \frac{y+1}{4} = \frac{z-6}{2}$