

$$2) \vec{AB} = \begin{pmatrix} 10 & -4 \\ -8 & 2 \\ 9 & -(-1) \end{pmatrix} = \begin{pmatrix} 6 \\ -20 \\ 10 \end{pmatrix} \quad \vec{AC} = \begin{pmatrix} 4 & -4 \\ 0 & 2 \\ 1 & -(-1) \end{pmatrix} = \begin{pmatrix} 0 \\ -2 \\ 2 \end{pmatrix}$$

$$\vec{OS} = \frac{1}{3} \vec{AB} + \frac{1}{3} \vec{AC} = \begin{pmatrix} 2 \\ -\cancel{8} \\ 4 \end{pmatrix} - 4$$

~~$$\vec{BC} = \begin{pmatrix} 10 \\ -8 \\ 9 \end{pmatrix}$$~~

$$\vec{BC} = \begin{pmatrix} -6 \\ 8 \\ -8 \end{pmatrix}$$

$$\vec{AM}_a = \vec{AB} + \frac{1}{2} \vec{BC} = \begin{pmatrix} 3 \\ -6 \\ 6 \end{pmatrix}$$

$$|\vec{AM}_a| = \sqrt{3^2 + (-6)^2 + 6^2} = 9 \text{ LE}$$

$$\vec{BM}_b = -\vec{AB} + \frac{1}{2} \vec{AC} = \begin{pmatrix} -6 \\ 9 \\ -9 \end{pmatrix}$$

$$|\vec{BM}_b| = \sqrt{(-6)^2 + (9)^2 + (-9)^2} = 3\sqrt{22} \text{ LE}$$

$$\vec{CM}_c = \frac{3}{2} (\vec{OS} - \vec{OC}) = \begin{pmatrix} -1 \\ -6 \\ 4,5 \end{pmatrix}$$

$$|\vec{CM}_c| = \frac{3\sqrt{29}}{2}$$

$$b) \frac{1}{3} \left(\begin{pmatrix} 4 \\ 2 \\ -1 \end{pmatrix} + \begin{pmatrix} 10 \\ -8 \\ 9 \end{pmatrix} + \begin{pmatrix} 4 \\ 0 \\ 1 \end{pmatrix} \right) = \begin{pmatrix} 6 \\ -2 \\ 3 \end{pmatrix}$$

$$c) \vec{OS} - \frac{1}{3} \vec{OA} - \frac{1}{3} \vec{OB} = \frac{1}{3} \vec{OC} = \begin{pmatrix} 5 \\ 6 \\ 3 \end{pmatrix} - \frac{1}{3} \begin{pmatrix} 4 \\ 9 \\ 2 \end{pmatrix} - \frac{1}{3} \begin{pmatrix} 15 \\ 18 \\ 9 \end{pmatrix} = \begin{pmatrix} -\frac{4}{3} \\ 9 \\ -\frac{2}{3} \end{pmatrix}$$

$$\frac{1}{3} \vec{OC} = \begin{pmatrix} -\frac{4}{3} \\ 9 \\ -\frac{2}{3} \end{pmatrix} \Rightarrow \vec{OC} = \begin{pmatrix} -4 \\ 27 \\ -2 \end{pmatrix}$$

$$C(-4; 27; -2)$$