

Nr. 1)

$$a) A = |\vec{a} \times \vec{b}| = \left| \begin{pmatrix} 3 \\ 2 \\ -1 \end{pmatrix} \times \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix} \right| = \left| \begin{pmatrix} 1 \\ -1 \\ 1 \end{pmatrix} \right|$$

$$\begin{array}{r} 2 \times 1 \\ -1 \times 0 \\ 3 \times 1 \\ 2 \times 1 \end{array}$$

$$A = \sqrt{1^2 + (-1)^2 + 1^2} = \underline{\underline{\sqrt{3} \text{ FE}}}$$

$$b) A = \left| \begin{pmatrix} -1 \\ 4 \\ -3 \end{pmatrix} \times \begin{pmatrix} 4 \\ 0 \\ -1 \end{pmatrix} \right| = \left| \begin{pmatrix} -4 \\ -13 \\ -16 \end{pmatrix} \right| = \sqrt{(-4)^2 + (-13)^2 + (-16)^2} = \underline{\underline{21 \text{ FE}}}$$

$$c) A = \left| \begin{pmatrix} 5 \\ 4 \\ -2 \end{pmatrix} \times \begin{pmatrix} 5 \\ -1 \\ 0 \end{pmatrix} \right| = \left| \begin{pmatrix} -2 \\ -10 \\ 25 \end{pmatrix} \right| = \sqrt{(-2)^2 + (-10)^2 + (25)^2} = \underline{\underline{27 \text{ FE}}}$$

$$\begin{array}{r} 4 \times -1 \\ -2 \times 0 \\ 5 \times 5 \\ 4 \times -1 \end{array}$$

$$d) A = \left| \begin{pmatrix} 0 \\ 2 \\ -1 \end{pmatrix} \times \begin{pmatrix} -12 \\ 5 \\ 3 \end{pmatrix} \right| = \left| \begin{pmatrix} 11 \\ 12 \\ 24 \end{pmatrix} \right| = \sqrt{11^2 + 12^2 + 24^2} = \underline{\underline{29 \text{ FE}}}$$

$$\begin{array}{r} 2 \times 5 \\ -1 \times 3 \\ 0 \times -12 \\ 2 \times 5 \end{array}$$

Nr. 2) a) A(4|7|15); B(0|5|19); C(8|7|13)

$$\vec{AB} = \begin{pmatrix} -4 \\ -2 \\ 4 \end{pmatrix}; \vec{AC} = \begin{pmatrix} 4 \\ 0 \\ -2 \end{pmatrix} \Rightarrow A_{\Delta} = \frac{1}{2} \left| \begin{pmatrix} -4 \\ -2 \\ 4 \end{pmatrix} \times \begin{pmatrix} 4 \\ 0 \\ -2 \end{pmatrix} \right|$$

$$\begin{array}{r} -2 \times 0 \\ 4 \times -2 \\ -4 \times 4 \\ -2 \times 0 \end{array}$$

$$A_{\Delta} = \frac{1}{2} \left| \begin{pmatrix} 4 \\ 8 \\ 8 \end{pmatrix} \right| = \frac{1}{2} \sqrt{4^2 + 8^2 + 8^2} = \frac{1}{2} \cdot 12 = \underline{\underline{6 \text{ FE}}}$$

b) A(-1|0|15); B(2|2|2); C(2|2|0)

$$\vec{AB} = \begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix}; \vec{AC} = \begin{pmatrix} 3 \\ 2 \\ -5 \end{pmatrix}$$

$$\begin{array}{r} 2 \times 2 \\ -3 \times -5 \\ 3 \times 3 \\ 2 \times 2 \end{array}$$

$$A_{\Delta} = \frac{1}{2} \left| \begin{pmatrix} 3 \\ 2 \\ -3 \end{pmatrix} \times \begin{pmatrix} 3 \\ 2 \\ -5 \end{pmatrix} \right| = \frac{1}{2} \left| \begin{pmatrix} -4 \\ 6 \\ 0 \end{pmatrix} \right| = \frac{1}{2} \sqrt{(-4)^2 + 6^2} = \sqrt{\frac{52}{4}} =$$

$$\underline{\underline{A_{\Delta} = \sqrt{13} \approx 3,61 \text{ FE}}}$$