Soluție

.a) $\left.\begin{array}{l}\overrightarrow{AB}=\overrightarrow{AC}+\overrightarrow{CB}\\ \overrightarrow{DC}=\overrightarrow{DB}+\overrightarrow{BC}\end{array}\right\}\Rightarrow \overrightarrow{AB}+\overrightarrow{DC}=\overrightarrow{AC}+\overrightarrow{DB}$

1.b) $\overrightarrow{AB}+2\overrightarrow{CD}+\overrightarrow{AD}==-\vec{i}+4\vec{j}-4\vec{i}-16\vec{j}-6\vec{i}-6\vec{j}=-11\cdot\vec{i}-18\cdot\vec{j}\Rightarrow$ coordonatele vectorului $\overrightarrow{AB}+2\overrightarrow{CD}+\overrightarrow{AD}$ sunt $(-11;-18)$

Din teorema sinusurilor rezultă: $\dfrac{BC}{\sin 60^\circ}=\dfrac{AC}{\sin B}\Leftrightarrow \dfrac{\sqrt{3}}{\frac{\sqrt{3}}{2}}=\dfrac{2}{\sin B}\Rightarrow \sin B=1$

2.a) Deci $m(\sphericalangle B)=90^\circ$. Atunci $\sin C=\cos A=\dfrac{1}{2}=\dfrac{AB}{AC}\Rightarrow AB=\dfrac{AC}{2}=1\Rightarrow$

Perimetrul $\triangle ABC$ este $AB+BC+AC=3+\sqrt{3}$

2.b) $AD=\dfrac{AB\cdot AC}{BC}$, unde $AD\perp BC$, $D\in[BC]\Rightarrow AD=\dfrac{AB\cdot AC}{\sqrt{AB^2+AC^2}}=\dfrac{3\sqrt{3}\cdot 3}{\sqrt{27+9}}=\dfrac{9\sqrt{3}}{\sqrt{36}}=\dfrac{9\sqrt{3}}{6}=\dfrac{3\sqrt{3}}{2}$

3.a) $AB=\sqrt{(x_B-x_A)^2+(y_B-y_A)^2}=\sqrt{16+4}=\sqrt{20}=2\sqrt{5}$

3.b) Fie M mijlocul segmentului $[AB]$, $M(-1,2)$.

$m_{AB}=\dfrac{y_B-y_A}{x_B-x_A}=\dfrac{2}{4}=\dfrac{1}{2}$. Atunci ecuația mediatoarei AM este $\dfrac{y-2}{x+1}=-2\Rightarrow$

$AM: y+2x=0$