

Soluție

1. a) $\overrightarrow{MN} = \overrightarrow{MD} + \overrightarrow{DC} + \overrightarrow{CN}$, $\overrightarrow{MN} = \overrightarrow{MA} + \overrightarrow{AB} + \overrightarrow{BN}$, deci $2 \cdot \overrightarrow{MN} = (\overrightarrow{MD} + \overrightarrow{MA}) + (\overrightarrow{DC} + \overrightarrow{AB}) + (\overrightarrow{CN} + \overrightarrow{BN})$ și $2 \cdot \overrightarrow{MN} = \overrightarrow{DC} + \overrightarrow{AB}$.

b) $\frac{a+2}{2} = \frac{6}{a-2}$, $a = \pm 4$.

2. a) $DB = 3$, $CD = 1$. Aria este $2\sqrt{3}$.

b) $\cos C = \frac{AC^2 + BC^2 - AB^2}{2 \cdot AC \cdot BC}$, $\cos C = \frac{\sqrt{6} - \sqrt{2}}{4}$.

3. a) $AB = 4\sqrt{2}$, $BC = 5\sqrt{2}$, $AC = 5\sqrt{2}$.

b) $AC: x - y + 2 = 0$, $d(B, AC) = 3\sqrt{2}$.