

Soluție

1. a) $\overrightarrow{MB} = \overrightarrow{MC} + \overrightarrow{CB}$, $\overrightarrow{CB} = \frac{1}{4}\overrightarrow{CA} \Rightarrow 4\overrightarrow{MB} = 4\overrightarrow{MC} + \overrightarrow{CA} = 4\overrightarrow{MC} + \overrightarrow{CM} + \overrightarrow{MA} = 3\overrightarrow{MC} + \overrightarrow{MA}$.

1. b) $\overrightarrow{MA} = 4\overrightarrow{MB} - 3\overrightarrow{MC} = \overrightarrow{MB} + 3(\overrightarrow{MB} - \overrightarrow{MC}) = \overrightarrow{MB} + 3\overrightarrow{CB} = \overrightarrow{MB} + 3\overrightarrow{CN} + 3\overrightarrow{NB} = \overrightarrow{MB} + 3\overrightarrow{CN} + \overrightarrow{BM} = 3\overrightarrow{CN}$.

2. a) $AD = \frac{AB\sqrt{3}}{2} \Rightarrow AD = 5\sqrt{3}$.

2. b) În triunghiul ABE avem $m(\sphericalangle BAE) = 90^\circ$ și $m(\sphericalangle ABE) = 60^\circ \Rightarrow BE = 2AB \Rightarrow BE = 20$.

3. a) Dacă $d \cap Ox = \{D\} \Rightarrow y_D = 0 \Rightarrow x_D = \frac{3y_D - 6}{2} = -3$.

3. b) $m_{AB} = \frac{y_B - y_A}{x_B - x_A} = -\frac{3}{2}$, $m_{AC} = \frac{y_C - y_A}{x_C - x_A} = \frac{2}{3} \Rightarrow m_{AB} \cdot m_{AC} = -1 \Rightarrow AB \perp AC$.