

Soluții

- 1.a)** Fie M mijlocul segmentului $[BC]$. Avem $\overrightarrow{BC} = 2\overrightarrow{BM}$.
 $\overrightarrow{BM} = \overrightarrow{DE}$ ($DEMB$ paralelogram) $\Rightarrow \overrightarrow{BC} = 2\overrightarrow{DE}$.

- $\overrightarrow{GG_1} = \frac{2}{3}\overrightarrow{GM}$, M mijlocul segmentului $[BC]$.
1.b) $\overrightarrow{GG_1} = \frac{\cancel{2}}{3} \cdot \frac{1}{\cancel{2}}\overrightarrow{AG} = \frac{1}{3}\overrightarrow{AG}$.

2.a) $\sigma[ABC] = \frac{AB \cdot AC \cdot \sin A}{2} = \frac{3 \cdot 4 \cdot \frac{\sqrt{2}}{2}}{2} = 3\sqrt{2}$.

$BC^2 = AB^2 + AC^2 - 2 \cdot AB \cdot AC \cdot \cos A \Rightarrow AC^2 + 2AC - 8 = 0 \Rightarrow$
2.b) $AC = \frac{-2 + \sqrt{36}}{2} = 2$.

3.a) $M(1;4) \Rightarrow AM = \sqrt{1+9} = \sqrt{10}$.

Fie $BD \perp AC, D \in [AC]$.
3.b) $m_{AC} = 2 \Rightarrow BD: \frac{y-3}{x} = -\frac{1}{2} \Leftrightarrow BD: x+2y-6=0$.