

Soluții

$$\mathbf{1.a)} \left. \begin{array}{l} \overrightarrow{MA} = \overrightarrow{MO} + \overrightarrow{OA} \\ \overrightarrow{MB} = \overrightarrow{MO} + \overrightarrow{OB} \\ \overrightarrow{MC} = \overrightarrow{MO} + \overrightarrow{OC} \\ \overrightarrow{MD} = \overrightarrow{MO} + \overrightarrow{OD} \end{array} \right\} \Rightarrow \overrightarrow{MA} + \overrightarrow{MB} + \overrightarrow{MC} + \overrightarrow{MD} = 4\overrightarrow{MO}$$

$$\mathbf{1.b)} \quad 3(\vec{3i} + 5\vec{j}) + 5(\alpha\vec{i} - 3\vec{j}) = \vec{0} \Leftrightarrow 9\vec{i} + 15\vec{j} + 5\alpha\vec{i} - 15\vec{j} = \vec{0} \Rightarrow \alpha = -\frac{9}{5}$$

$$\mathbf{2.a)} \quad BC^2 = AB^2 + AC^2 - 2 \cdot AB \cdot AC \cdot \cos A = 100 + 400 - 400 \cdot \frac{1}{2} = 300 \Rightarrow BC = 10\sqrt{3}$$

$$\mathbf{2.b)} \quad \sigma[ABC] = \frac{BC \cdot AC \cdot \sin C}{2} = \frac{\cancel{2}\sqrt{2} \cdot \frac{\sqrt{2}}{\cancel{2}}}{2} = 1$$

$$\mathbf{3.a)} \left. \begin{array}{l} AB = \sqrt{1+9} = \sqrt{10} \\ AC = \sqrt{9+1} = \sqrt{10} \\ BC = \sqrt{4+4} = 2\sqrt{2} \end{array} \right\} \Rightarrow p = 2\sqrt{10} + 2\sqrt{2}$$

$$\mathbf{3.b)} \quad \frac{8-4}{\alpha+3} = \frac{6-4}{5+3} \Leftrightarrow 32 = 2\alpha + 6 \Rightarrow \alpha = 13$$