

Β ΛΥΚΕΙΟΥ ΘΕΤΙΚΟΣ ΠΡΟΣΑΝΑΤΟΛΙΣΜΟΣ

5.11 1)

α) Είναι $(\overrightarrow{AB}, \overrightarrow{BG}) = 120^\circ$ οπότε

$$\overrightarrow{AB} \cdot \overrightarrow{BG} = |\overrightarrow{AB}| \cdot |\overrightarrow{BG}| \cdot \cos(\overrightarrow{AB}, \overrightarrow{BG}) = 10 \cdot 10 \cdot \cos 120^\circ = 100 \cdot \left(-\frac{1}{2}\right) = -50$$

β) Με Πυθαγόρειο Θεώρημα στο τρίγωνο AMB έχουμε

$$AM^2 = AB^2 - BM^2 \Rightarrow AM^2 = 10^2 - 5^2 \Rightarrow AM^2 = 75 \Rightarrow AM = \sqrt{75} \Rightarrow AM = 5\sqrt{3}, \text{ επομένως}$$

$$\overrightarrow{AB} \cdot \overrightarrow{AM} = |\overrightarrow{AB}| \cdot |\overrightarrow{AM}| \cdot \cos(\overrightarrow{AB}, \overrightarrow{AM}) \stackrel{(\overrightarrow{AB}, \overrightarrow{AM}) = \frac{60^\circ}{2}}{=} 10 \cdot 5\sqrt{3} \cdot \cos 30^\circ = 50\sqrt{3} \cdot \frac{\sqrt{3}}{2} = 75$$

γ) Είναι $\overrightarrow{BG} \perp \overrightarrow{AM}$ και άρα $\overrightarrow{BG} \cdot \overrightarrow{AM} = 0$

5.11 2)

Είναι $(\overrightarrow{AB}, \overrightarrow{AG}) = 60^\circ$. Οπότε

$$\overrightarrow{AB} \cdot \overrightarrow{AG} = |\overrightarrow{AB}| \cdot |\overrightarrow{AG}| \cdot \cos(\overrightarrow{AB}, \overrightarrow{AG}) = 10 \cdot 10 \cdot \cos 60^\circ = 100 \cdot \frac{1}{2} = 50$$

5.11 3)

Είναι $(\overrightarrow{BA}, \overrightarrow{GB}) = 120^\circ$. Οπότε

$$\overrightarrow{BA} \cdot \overrightarrow{GB} = |\overrightarrow{BA}| \cdot |\overrightarrow{GB}| \cdot \cos(\overrightarrow{BA}, \overrightarrow{GB}) = 10 \cdot 10 \cdot \cos 120^\circ = 100 \cdot \left(-\frac{1}{2}\right) = -50$$

5.11 4)

Είναι $(\overrightarrow{GA}, \overrightarrow{BM}) = 120^\circ$. Οπότε

$$\overrightarrow{GA} \cdot \overrightarrow{BM} = |\overrightarrow{GA}| \cdot |\overrightarrow{BM}| \cdot \cos(\overrightarrow{GA}, \overrightarrow{BM}) = 10 \cdot 5 \cdot \cos 120^\circ = 50 \cdot \left(-\frac{1}{2}\right) = -25$$

5.11 5)

Είναι $(\overrightarrow{MA}, \overrightarrow{GM}) = 90^\circ$. Οπότε

$$\overrightarrow{MA} \cdot \overrightarrow{GM} = |\overrightarrow{MA}| \cdot |\overrightarrow{GM}| \cdot \cos(\overrightarrow{MA}, \overrightarrow{GM}) = 5\sqrt{3} \cdot 5 \cdot 0 = 0$$

5.11 6)

Είναι $(\overrightarrow{AG}, \overrightarrow{AM}) = 30^\circ$. Οπότε

$$\overrightarrow{AG} \cdot \overrightarrow{AM} = |\overrightarrow{AG}| \cdot |\overrightarrow{AM}| \cdot \cos(\overrightarrow{AG}, \overrightarrow{AM}) = 10 \cdot 5\sqrt{3} \cdot \cos 30^\circ = 50 \cdot \frac{\sqrt{3} \cdot \sqrt{3}}{2} = 75$$

5.11 7)

Είναι $(\overrightarrow{MA}, \overrightarrow{BM}) = 90^\circ$. Οπότε

$$\overrightarrow{MA} \cdot \overrightarrow{BM} = |\overrightarrow{MA}| \cdot |\overrightarrow{BM}| \cdot \cos(\overrightarrow{MA}, \overrightarrow{BM}) = 5\sqrt{3} \cdot 5 \cdot \cos 90^\circ = 25\sqrt{3} \cdot 0 = 0$$

5.11 8)

Είναι $\left(\overrightarrow{MA}, \overrightarrow{AB}\right) = 120^\circ$. Οπότε

$$\overrightarrow{MA} \cdot \overrightarrow{AB} = |\overrightarrow{MA}| \cdot |\overrightarrow{AB}| \cdot \cos\left(\overrightarrow{MA}, \overrightarrow{AB}\right) = 5\sqrt{3} \cdot 10 \cdot \cos 120^\circ = 50 \cdot \sqrt{3} \cdot \left(\frac{\sqrt{3}}{2}\right) = -75$$

5.11 9)

Είναι $\left(\overrightarrow{AG}, \overrightarrow{GM}\right) = 120^\circ$. Οπότε

$$\overrightarrow{AG} \cdot \overrightarrow{GM} = |\overrightarrow{AG}| \cdot |\overrightarrow{GM}| \cdot \cos\left(\overrightarrow{AG}, \overrightarrow{GM}\right) = 10 \cdot 5 \cdot \cos 120^\circ = 50 \cdot \left(-\frac{1}{2}\right) = -25$$

5.11 10)

Είναι $\left(\overrightarrow{GA}, \overrightarrow{GB}\right) = 60^\circ$. Οπότε

$$\overrightarrow{GA} \cdot \overrightarrow{GB} = |\overrightarrow{GA}| \cdot |\overrightarrow{GB}| \cdot \cos\left(\overrightarrow{GA}, \overrightarrow{GB}\right) = 10 \cdot 10 \cdot \cos 60^\circ = 100 \cdot \frac{1}{2} = 50$$