α. $\overrightarrow{AB} = (2-4, 5-(-1)) = (-2, 6)$ και $\overrightarrow{A\Gamma} = (-3-4, 4-(-1)) = (-7, 5)$. Άρα

$$\overrightarrow{AB} \cdot \overrightarrow{A\Gamma} = (-2, 6) \cdot (-7, 5) = (-2) \cdot (-7) + 6 \cdot 5 = 14 + 30 = 44$$

β. $\overrightarrow{B\Gamma} = (-3-2, 4-5) = (-5, -1)$ οπότε

$$\overrightarrow{A\Gamma} \cdot \overrightarrow{B\Gamma} = (-7, 5) \cdot (-5, -1) = (-7) \cdot (-5) + 5 \cdot (-1) = 35 - 5 = 30$$

Το M είναι μέσο του $B\Gamma$ οπότε

$$x_M = \frac{x_B + x_\Gamma}{2} = \frac{2-3}{2} = -\frac{1}{2}$$

και

$$y_M = \frac{y_B + y_\Gamma}{2} = \frac{5+4}{2} = \frac{9}{2}$$

οπότε $M\left(-\frac{1}{2}, \frac{9}{2}\right)$.