

ΛΥΣΗ

α) Έχουμε:

$$\begin{cases} \alpha_3 = 8 \\ \alpha_8 = 23 \end{cases} \Leftrightarrow \begin{cases} \alpha_1 + 2\omega = 8 \\ \alpha_1 + 7\omega = 23 \end{cases} \stackrel{(-)}{\Leftrightarrow} \begin{cases} 5\omega = 15 \\ \alpha_1 + 2\omega = 8 \end{cases} \Leftrightarrow \begin{cases} \omega = 3 \\ \alpha_1 + 2 \cdot 3 = 8 \end{cases} \Leftrightarrow \begin{cases} \omega = 3 \\ \alpha_1 = 2 \end{cases}.$$

β) Είναι: $\alpha_{31} = \alpha_1 + 30\omega = 2 + 30 \cdot 3 = 92$.

γ) Έχουμε:

$$\begin{aligned} S &= (\alpha_1 + 1) + (\alpha_2 + 2) + (\alpha_3 + 3) + \dots + (\alpha_{31} + 31) \\ &= (\alpha_1 + \alpha_2 + \alpha_3 + \dots + \alpha_{31}) + (1 + 2 + 3 + \dots + 31) = \\ &= \frac{31}{2} \cdot (2 \cdot 2 + 30 \cdot 3) + \frac{31}{2} \cdot (2 \cdot 1 + 30 \cdot 1) = \frac{31}{2} \cdot (94 + 32) = \\ &= \frac{31}{2} \cdot 126 = 1953. \end{aligned}$$