

① $f(x) = 2\sin x - 1$ Να βρείτε i) T ii) $\max - \min$ iii) $f(A)$ iv) τις λύσεις της εξίσωσης $f(x) = 0$ στο διάστημα $[0, 2\pi]$

Λύση

i) $T = \frac{2\pi}{\omega} = 2\pi.$

ii) $-1 \leq \sin x \leq 1 \Rightarrow -2 \leq 2\sin x \leq 2 \Rightarrow -3 \leq 2\sin x - 1 \leq 1$ αφού $\max = 1$
 $\min = -3$ iii) $f(A) = [-3, 1]$

iv) $f(x) = 0 \Rightarrow 2\sin x - 1 = 0 \Rightarrow \sin x = \frac{1}{2} \Rightarrow \sin x = \sin \frac{\pi}{6} \Rightarrow \begin{cases} x = 2k\pi + \frac{\pi}{6} \\ x = 2k\pi + \pi - \frac{\pi}{6} \end{cases}$

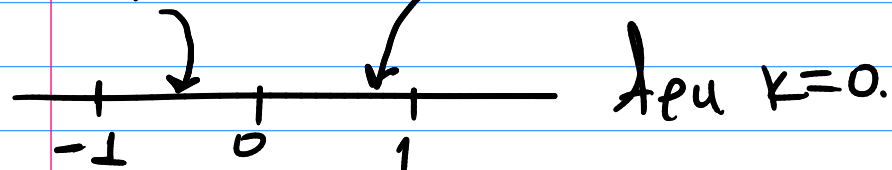
$$0 \leq 2k\pi + \frac{\pi}{6} \leq 2\pi.$$

$$0 \leq 12k\pi + \pi \leq 12\pi.$$

$$-\pi \leq 12k\pi \leq 11\pi.$$

$$\frac{-\pi}{12\pi} \leq k \leq \frac{11\pi}{12\pi}$$

$$-\frac{1}{12} \leq k \leq \frac{11}{12}.$$



Άρα $x = 2 \cdot 0 \cdot \pi + \frac{\pi}{6} = \frac{\pi}{6}$

$$0 \leq 2k\pi + \pi - \frac{\pi}{6} \leq 2\pi.$$

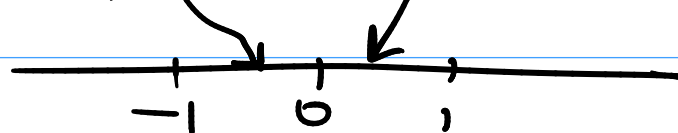
$$0 \leq 12k\pi + 6\pi - \pi \leq 12\pi.$$

$$0 \leq 12k\pi + 5\pi \leq 12\pi.$$

$$-5\pi \leq 12k\pi \leq 7\pi.$$

$$\frac{-5\pi}{12\pi} \leq k \leq \frac{7\pi}{12\pi}$$

$$-\frac{5}{12} \leq k \leq \frac{7}{12}$$



Άρα $k=0$ αφού $x = 2 \cdot 0 \cdot \pi + \pi - \frac{\pi}{6} \Rightarrow \frac{6\pi}{6} - \frac{\pi}{6} = \frac{5\pi}{6}$