LS-Kursstufe Seite 138

10a) $5 \cdot \cos(x) = 0 \quad ; \quad I = [0; 2\pi] \quad ; \quad p = 2\pi$

$\cos(x) = 0$ für $x_1 = \frac{p}{4}$ oder $x_2 = \frac{3}{4} p$

$\Rightarrow \underline{\underline{x_1}} = \frac{2\pi}{4} = \underline{\underline{\frac{1}{2}\pi}} \vee \underline{\underline{x_2}} = \frac{3}{4} \cdot 2\pi = \underline{\underline{\frac{3}{2}\pi}}$

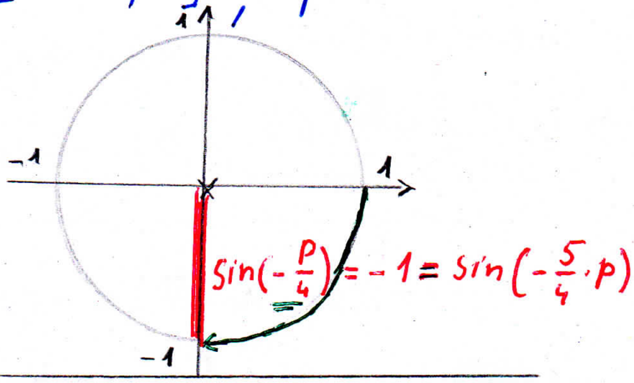
---

b) $-3 \cdot \sin(x) = 3 \,|:(-3) \quad ; \quad I = [-2\pi; 0] \quad ; \quad p = 2\pi$

$\sin(x) = -1$

$\Rightarrow \underline{\underline{x_1}} = -\frac{2\pi}{4} = \underline{\underline{-\frac{1}{2}\pi}}$

$\left[x_2 = -\frac{5}{4} \cdot 2\pi = -\frac{5}{2}\pi \notin I \right]$



---

c) $\sin^2(x) + \sin(x) = 0 \quad ; \quad I = [0; 2\pi] \quad ; \quad p = 2\pi$

$\sin(x) \cdot (\sin(x) + 1) = 0$

$\sin(x) = 0$ für $0 \cdot p ; \frac{1}{2} p \vee 1 \cdot p \Rightarrow \underline{\underline{x_1 = 0 \cdot 2\pi = 0}} \vee \underline{\underline{x_2 = \frac{1}{2} \cdot 2\pi = \pi}} \vee$

$\underline{\underline{x_3 = 2\pi}}$

$\sin(x) + 1 = 0 \Rightarrow \sin(x) = -1$ für $\frac{3}{4} p \Rightarrow \sin(\frac{3}{4} \cdot 2\pi) = -1$

$\underline{\underline{x_4 = \frac{3}{2}\pi}} \quad ; \left[\sin(x) = -1 \text{ für } \frac{5}{4} p \Rightarrow \sin(\frac{5}{4} \cdot 2\pi) = -1 \Rightarrow x_4 = \frac{5}{2}\pi \notin I \right]$

---

d) $\sin^2(x) + \frac{1}{2} \sin(x) = \frac{1}{2} \quad ; \quad I = [0; 2\pi] \quad ; \quad p = 2\pi$

Sub: $\sin(x) = u \Rightarrow u^2 + \frac{1}{2} u = \frac{1}{2} \Rightarrow u^2 + \frac{1}{2} u - \frac{1}{2} = 0$

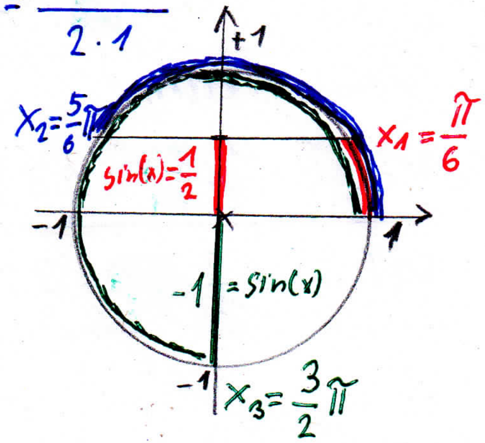
$$u_{1/2} = \frac{-\frac{1}{2} \pm \sqrt{\left(\frac{1}{2}\right)^2 - 4 \cdot 1 \cdot \left(-\frac{1}{2}\right)}}{2 \cdot 1} = \frac{-\frac{1}{2} \pm \sqrt{\frac{9}{4}}}{2 \cdot 1} = \frac{-\frac{1}{2} \pm \frac{3}{2}}{2 \cdot 1}$$

$u_1 = \frac{\frac{2}{2}}{2} = \frac{1}{2} \quad \vee \quad u_2 = \frac{-\frac{4}{2}}{2} = -1$

Rück. Sub.

$\sin(x) = \frac{1}{2} \quad \vee \quad \sin(x) = -1$

$\underline{\underline{x_1 = \frac{\pi}{6}}} \vee \underline{\underline{x_2 = \frac{5}{6}\pi}} \quad \vee \quad \underline{\underline{x_3 = \frac{3}{2}\pi}}$



O. Fell