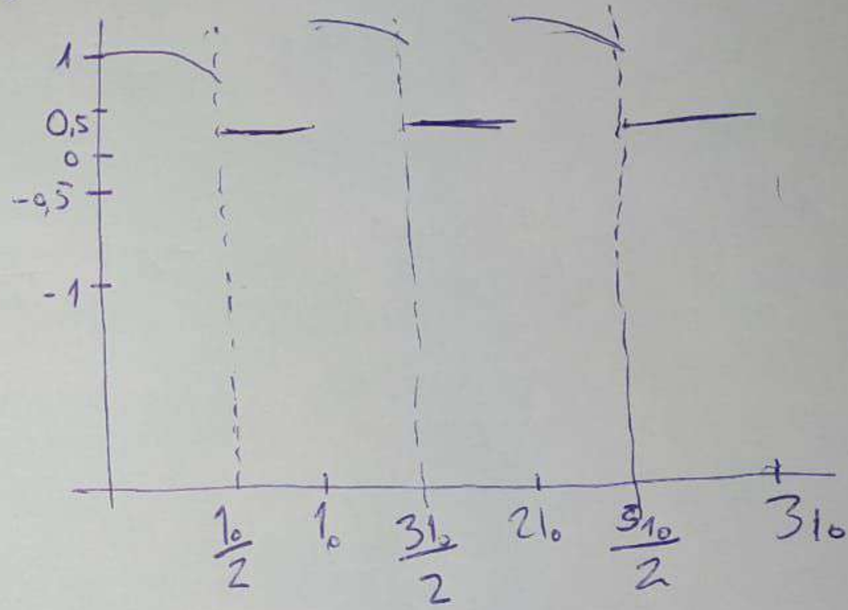
$$f(x) = \begin{cases} U_0 \cdot \cos(K_1 \cdot x) & ; 0 < x < \frac{\lambda_0}{2} \\ 0 & ; \frac{\lambda_0}{2} < x < \lambda_0 \end{cases} \quad ; K_1 = 10 \cdot K_0 , \quad K_0 = \frac{2\pi}{\lambda_0}$$

$$F(x) = \frac{a_0}{2} + \sum_{m=1}^{\infty} a_m \cdot \cos(m \cdot k \cdot x) + \sum_{m=1}^{\infty} b_n \cdot \mathrm{Sen}(m \cdot k \cdot x)$$

$$A_0 = \frac{2}{\lambda_0} \int_0^{\frac{\lambda_0}{2}} U_0 \cdot \cos(K_1 \cdot x)\, dx + \cancel{\frac{1}{\lambda_0} \int_{\frac{\lambda_0}{2}}^{\lambda_0} 0 \, dx}^{\,0}$$



$$A_0 = \frac{2}{\lambda_0} \int_0^{\frac{\lambda_0}{2}} U_0 \cdot \cos(K_1 \cdot x)\, dx$$

$$2 \cdot \frac{U_0}{\lambda_0} \cdot \frac{\mathrm{Sen}(K_1 \cdot x)}{K_1} = \left[\frac{2U_0}{\lambda_0 K_1} \cdot \mathrm{Sen}(K_1 \cdot x) \right]_0^{\frac{\lambda_0}{2}}$$

$$\frac{2U_0}{K_1 \lambda_0} \left(\mathrm{Sen}\left(K_1 \cdot \frac{\lambda_0}{2}\right) - \cancel{\mathrm{Sen}(0)}^{\,0} \right)$$

$$\rightarrow \frac{2U_0}{\lambda_0 \cdot \frac{20\pi}{\lambda_0}} \left(\mathrm{Sen}\left(\frac{\frac{20\pi}{\lambda} \cdot \lambda_0}{2} \right) \right)$$

$$\frac{2U_0}{\frac{\cancel{\lambda_0}\,20\pi}{\cancel{\lambda_0}}} = \frac{2U_0}{20\pi} = \frac{U_0}{10\pi} \;;\; \frac{\frac{20\pi}{\lambda}\cdot\lambda_0}{2} = \frac{20\pi\cdot\cancel{\lambda_0}}{2\cancel{\lambda}} = 10\pi$$

$$\rightarrow \frac{\cancel{V_0}}{10\pi}\cdot \text{Sen}(10\pi) \;//$$

$$A_m = \frac{2}{\lambda}\int_0^{\lambda_0} f(x)\cdot \cos(m\cdot k_0\cdot x)\,dx \rightarrow \frac{2U_0}{\lambda_0}\int_0^{\frac{\lambda_0}{2}} \overset{A}{\cos(k_1\cdot x)}\cdot \overset{B}{\cos\left(\frac{2\pi n \cancel{x}}{\lambda_0}\right)}\,dx$$

$$\rightarrow \cos(A)\cdot\cos(B) = \frac{1}{2}\cdot\left(\cos(A+B) + \cos(A-B)\right)$$

$$\rightarrow A_m = \frac{\cancel{2}U_0}{\lambda_0}\cdot\frac{1}{\cancel{2}}\int_0^{\frac{\lambda_0}{2}}\left(\cos\left(k_1+\frac{2\pi n}{\lambda_0}\right)x + \cos\left(k_1-\frac{2\pi n}{\lambda_0}\right)x\right)dx$$

$$= \frac{U_0}{\lambda_0}\left[\frac{\text{sen}\left(k_1+\frac{2\pi n}{\lambda_0}\right)x}{k_1+\frac{2\pi n}{\lambda_0}} + \frac{\text{Sen}\left(k_1-\frac{2\pi n}{\lambda_0}\right)x}{k_1-\frac{2\pi n}{\lambda_0}}\right]_0^{\frac{\lambda_0}{2}}$$

$$= \frac{U_0}{\lambda_0}\left[\frac{\text{sen}\left(\frac{20\pi}{\cancel{\lambda_0}}+\frac{\cancel{2}\pi n}{\cancel{\lambda_0}}\right)\frac{\cancel{\lambda_0}}{\cancel{2}}}{\frac{20\pi+2\pi n}{\cancel{\lambda_0}}} + \frac{\text{Sen}\left(\frac{\cancel{20}\pi}{\cancel{\lambda_0}}-\frac{\cancel{2}\pi n}{\cancel{\lambda_0}}\right)\cdot\frac{\cancel{\lambda_0}}{2}}{\frac{20\pi-2\pi n}{\cancel{\lambda_0}}}\right]$$

$$U_0 \cdot \left(\operatorname{Sen}\left(\frac{(10+n)\,\pi}{2\pi(10+n)}\right) + \operatorname{Sen}\left(\frac{(10-n)\,\pi}{2\pi((10-n))}\right)\right)$$

$$\rightarrow b_n = \frac{2}{\lambda_0}\int_0^{\lambda_0} f(x) \cdot \operatorname{sen}\left(\frac{2\pi n x}{\lambda_0}\right) dx$$

$$= \frac{2U_0}{\lambda}\int_0^{\frac{\lambda_0}{2}} \cdot \cos(\overset{A}{K_1 \cdot x}) \cdot \operatorname{Sen}\left(\overset{B}{\frac{2\pi n x}{\lambda_0}}\right) dx$$

$$\cos(A) - \operatorname{sen}(B) = \frac{1}{2}\left(\operatorname{sen}(A+B) - \operatorname{sen}(A-B)\right)$$

$$\rightarrow b_n = \frac{2U_0}{\lambda} \cdot \frac{1}{2}\int_0^{\frac{\lambda_0}{2}} \left(\left(\operatorname{sen}(K_1) + \frac{2\pi n}{\lambda_0}\right)x - \operatorname{Sen}\left(K_1 - \frac{2\pi n}{\lambda_0}\right)x\right) dx$$

$$= \frac{U_0}{\lambda}\left[\frac{-\cos\left(K_1 + \frac{2\pi n}{\lambda}\right)x}{K_1 + \frac{2\pi n}{\lambda_0}} + \frac{\cos\left(K_1 - \frac{2\pi n}{\lambda_0}\right)x}{K_1 - \frac{2\pi n}{\lambda_0}} \right]_{x_2 \; 0}^{x_1 \; \frac{\lambda_0}{2}}$$

x_1:

$$\frac{U_0}{\cancel{\lambda}}\left(\frac{-\cos\left(\frac{20\pi}{\cancel{\lambda_0}}+\frac{2\pi n}{\cancel{\lambda_0}}\right)\frac{\cancel{\lambda_0}}{2}}{\frac{20\pi+2\pi n}{\cancel{\lambda_0}}}+\frac{\cos\left(\frac{20\pi}{\cancel{\lambda_0}}-\frac{2\pi n}{\cancel{\lambda_0}}\right)\frac{\cancel{\lambda_0}}{2}}{\frac{20\pi-2\pi n}{\cancel{\lambda_0}}}\right)$$

$$\rightarrow U_0\left(\frac{-\cos(10+n)\pi}{2\pi(10+n)}+\frac{\cos(10-n)\pi}{2\pi(10-n)}\right) //$$

$x_1 \wedge x_2$: $-\cos(1)$

$$U_0\left(\frac{-\cos(10+n)\pi)+1}{2\pi(10+n)}+\frac{\cos(10-n)\pi-1}{2\pi(10-n)}\right) //$$