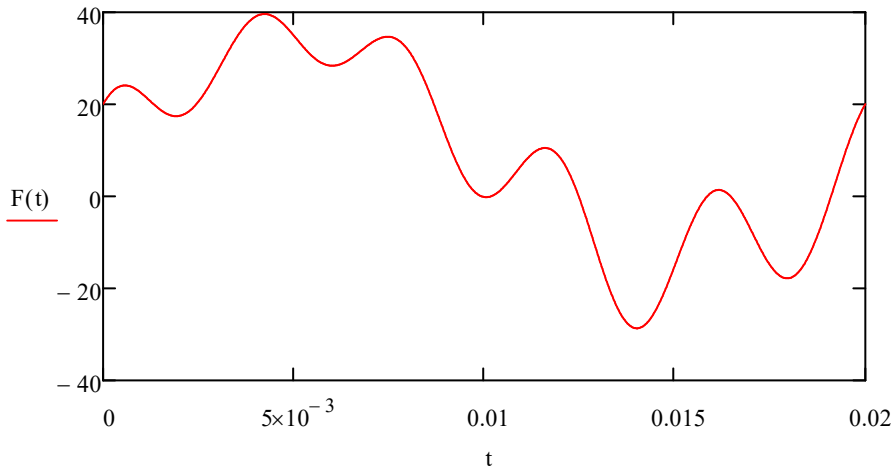
fourrier analyse $TOL := 10^{-5}$

$a0 := 10$ $a1 := 25$ $a2 := 5$ $a3 := 10.1$ $a4 := 0.1$ $ml := 10^{-3}$ $u := 10^{-6}$

$F(t) := a0 + a1\cdot\sin(2\cdot\pi\cdot50\cdot t) + a2\cdot\sin(2\cdot\pi\cdot200\cdot t) + a3\cdot\cos(2\cdot\pi\cdot250\cdot t) + a4\cdot\sin(2\cdot\pi\cdot500\cdot t)$

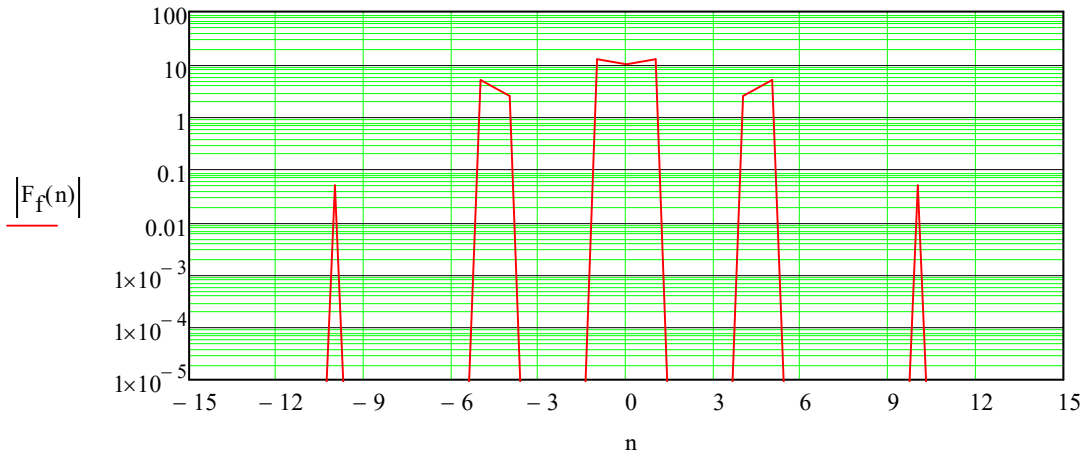
$T := \frac{1}{50}$ $T = 20\cdot ml$

$t := 0, 20\cdot u .. 20\cdot ml$



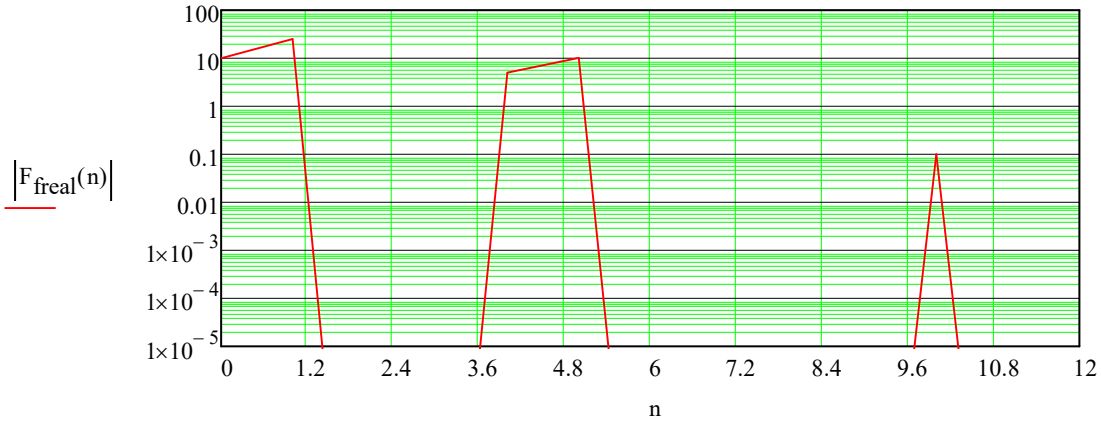
$$F_f(n) := \frac{1}{T}\cdot\int_0^T F(t)\cdot e^{\frac{-i\cdot2\cdot\pi\cdot n\cdot t}{T}}\,dt$$

$n := -11, -10 .. 11$



$n := 0, 1 .. 11$

$$F_{freal}(n) := \begin{cases} \left(\left|F_f(-n)\right| + \left|F_f(n)\right|\right) & \text{if } n > 0 \vee n < 0 \\ \dfrac{\left|F_f(-n)\right| + \left|F_f(n)\right|}{2} & \text{if } n = 0 \end{cases}$$



$$Fterug_m(t, Tper, harm) := \sum_{m=-harm}^{harm} \left(F_f(m) \cdot e^{i \cdot 2 \cdot \pi \cdot \frac{1}{Tper} \cdot m \cdot t}\right)$$

$$t := 0, 0.1 \cdot ml .. 20 \cdot ml$$