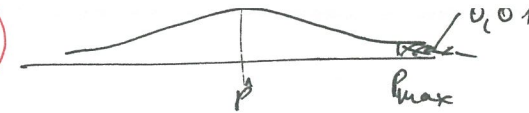


1.) $P_1 = 200 \pm 20 \text{ W} \Rightarrow \Delta P_1 = 20 \text{ W}$ $V_1 = \frac{\Delta P_1}{\sqrt{3}} = 11,55 \text{ V}$ (1) 

$\hat{P} = N_1 \cdot P_1 = 28,8 \text{ kW}$ $\sigma = \sqrt{N_1} \cdot V_1 = 138,56 \text{ W}$ $\Delta P = z_{0,01} \cdot \sigma = 322,85 \text{ W}$
 $2,33$ (egyoldaltu hof. int.)

$P_{\max} = \hat{P} + \Delta P = 29,123 \text{ kW}$ (2)

$P_{\max} = \sqrt{N_2} V_1 \cdot z_{0,01} + N_2 P_1 \Rightarrow N_2 P_1 + \sqrt{N_2} V_1 \cdot z_{0,01} - P_{\max} = 0$ $n_2 = \sqrt{N_2} > 0$

$n_2^2 P_1 + n_2 V_1 \cdot z_{0,01} - P_{\max} = 0$

$n_2 = \frac{-V_1 \cdot z_{0,01} + \sqrt{V_1^2 z_{0,01}^2 + 4 P_1 P_{\max}}}{2 P_1} = 12,804$ (5)

$N_2 = [n_2^2] = 148$ (2)

11.) $\varphi = 2\pi \frac{t}{T} = 2\pi f \cdot t = \omega t \Rightarrow \varphi = 7,5608 \text{ rad} (= 89,43^\circ)$ (1) ($\varphi < 0$, mert a alamm nelt a foz=hez helyest)

$Z = |Z| [\cos \varphi + j \sin \varphi] \Rightarrow Y = \frac{1}{|Z|} [\cos \varphi - j \sin \varphi] = \frac{1}{R_p} + j \omega C_p$ $R_p = \frac{|Z|}{\cos \varphi} = 99,68 \text{ kW}$

$C_p = \frac{-\sin \varphi}{|Z| \omega} = 1,000 \mu\text{F}$ (2)

$\frac{\Delta \varphi}{\varphi} = \frac{\Delta t}{t} \Rightarrow \Delta \varphi = \varphi \cdot \frac{\Delta t}{t}$

$\frac{\Delta R_p}{R_p} = \frac{\Delta \cos \varphi}{\cos \varphi} = \left| \frac{\sin \varphi}{\cos \varphi} \cdot \Delta \varphi \right| = \underbrace{\tan \varphi}_{\approx 100} \cdot \varphi \cdot \underbrace{\frac{\Delta t}{t}}_{100 \text{ ppm}} = 1,55\%$ (2) (5)