2.2.2. feladat

a) $N_1 = \dfrac{U_{1nv}}{U_N} = \dfrac{10500}{6{,}5} = 1615{,}38 \approx 1615$ menet

$N_1 = 1615$ menet

$N_2 = \dfrac{U_2}{U_N \cdot \sqrt{3}} = \dfrac{400}{6{,}5 \cdot \sqrt{3}} = 35{,}53 \approx 36$ menet

$N_2 = 36$ menet

b) $a = \dfrac{N_1}{N_2} = \dfrac{1615}{36} = 44{,}86$

$a = 44{,}86$

$I_{1nv} = \dfrac{S_n}{\sqrt{3} \cdot U_{1nv}} = \dfrac{250 \cdot 10^3}{\sqrt{3} \cdot 10{,}5 \cdot 10^3} = 13{,}75$ A

$I_{1nv} = 13{,}75$ A

$I_{1nf} = \dfrac{I_{1nv}}{\sqrt{3}} = \dfrac{13{,}75}{\sqrt{3}} = 7{,}94$ A

$I_{nf} = 7{,}94$ A

$I_{2nv} = \dfrac{S_n}{\sqrt{3} \cdot U_{2nv}} = \dfrac{250 \cdot 10^3}{\sqrt{3} \cdot 400} = 360{,}85$ A

$I_{2nv} = 360{,}85$ A

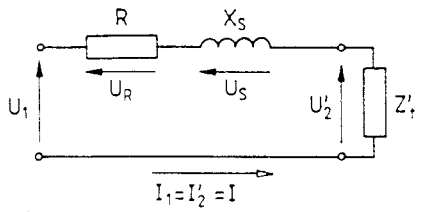
c) $\varepsilon_r = \dfrac{I_{1nf} \cdot R}{U_{1nv}} \cdot 100 \rightarrow R = \dfrac{U_{1nv} \cdot \varepsilon_r}{I_{1nf} \cdot 100} = \dfrac{10{,}5 \cdot 10^3 \cdot 1{,}5}{7{,}94 \cdot 100} = 19{,}836\ \Omega$

$R = 19{,}836\ \Omega$

$Z = \dfrac{U_{zn}}{I_{1nf}} = \dfrac{\varepsilon_n \cdot U_{1nv}}{100 \cdot I_{1nf}} = \dfrac{4{,}5 \cdot 10{,}5 \cdot 10^3}{100 \cdot 7{,}94} = 59{,}5\ \Omega$

$X_s = \sqrt{Z^2 - R^2} = \sqrt{59{,}5^2 - 19{,}836^2} = 56{,}096\ \Omega$

$X_s = 56{,}096\ \Omega$



$R = R_1 + R_2'$; $\quad X_s = S_{s1} + X_{s2}'$

d) $P_{tn} = 3 \cdot I_{1nf}^2 \cdot R = 3 \cdot 7{,}94^2 \cdot 19{,}836 = 3751{,}6$ W

$P_{tn} = 3751{,}6$ W

$\cos \varphi_z = \dfrac{R}{Z} = \dfrac{19{,}836}{59{,}5} = 0{,}333 \rightarrow \varphi_z = 70{,}53°$

$\cos \varphi_z = 0{,}333$