$$\sin\varphi_z = \sqrt{1-\cos^2\varphi_z} = \sqrt{1-0{,}287^2} = 0{,}958$$

$$R = Z_z \cdot \cos\varphi_z = 1{,}156 \cdot 0{,}287 = 0{,}332\ \Omega$$

$$X_s = Z_z \cdot \sin\varphi_z = 1{,}156 \cdot 0{,}958 = 1{,}107\ \Omega$$

$$Z_z' = \frac{U_{1n}}{\sqrt{3}\cdot I_i'} = \frac{380}{\sqrt{3}\cdot 95} = 2{,}31\ \Omega$$

$$Z_z' = \sqrt{(R+R_i)^2 + X_s^2} \quad \rightarrow \quad R_i = \sqrt{Z_z'^2 - X_s^2} - R$$

$$R_i = \sqrt{2{,}31^2 - 1{,}107^2} - 0{,}332 = 1{,}695\ \Omega$$

$R_i = 1{,}695\ \Omega$

e) $I_{in} = \frac{I_i}{2} = \frac{190}{2} = 95$ A

$$I_{in} = \frac{I_i}{a^2} \quad \rightarrow \quad a = \sqrt{\frac{I_i}{I_{in}}} = \sqrt{\frac{190}{95}} = \sqrt{2} = 1{,}41$$

$a = 1{,}41$

$$I_2 = a \cdot I_{in} = 1{,}41 \cdot 95 = 140{,}95\ \text{A}$$

$I_2 = 140{,}95$ A

$$M_i' = \frac{M_i}{a^2} = \frac{191{,}79}{2} = 95{,}895\ \text{N}\cdot\text{m}$$

$M_i' = 95{,}895$ N·m