Мнацаканов Антон ДП-82

$U_D = U - U_R$

$$\triangle U_D = \sqrt{(U-U_R)'^2_U \cdot \triangle U^2 + (U-U_R)_U R'^2 \cdot \triangle U_R^2} = \sqrt{\triangle U^2 + \triangle U_R^2}$$

$I_D = \frac{U_R}{R}$

$$\triangle I_D = \sqrt{\left(\frac{U_R}{R}\right)'^2_{UR} \cdot \triangle U_R^2 + \left(\frac{U_R}{R}\right)'^2_R \cdot \triangle R^2} = \sqrt{\frac{\triangle U_R^2}{R^2} + \frac{\triangle U_R^2}{R^4} \cdot \triangle R^2} = \frac{1}{R^2} \cdot \sqrt{(R\triangle U_R)^2 + (U_R \triangle R)^2}$$

$I_{Bup} = \frac{\varphi_T}{r_b}$

$$\triangle I_{Bup} = \frac{1}{r_b^2} \cdot \sqrt{(r_b \triangle \varphi_T)^2 + (\varphi_T \triangle r_b)^2}$$

$r_b = \frac{U_{np} - \varphi_0}{I_{np}}$

$$\triangle r_b = \sqrt{\left(\frac{U_{np}-\varphi_0}{I_{np}}\right)'^2_{U_{np}} \cdot \triangle U_{np}^2 + \left(\frac{U_{np}-\varphi_0}{I_{np}}\right)'^2_{\varphi_0} \cdot \triangle \varphi_0^2 + \left(\frac{U_{np}-\varphi_0}{I_{np}}\right)'^2_{I_{np}} \cdot \triangle I_{np}^2} =$$

$$= \sqrt{\frac{\triangle U_{np}^2}{I_{np}^2} + \frac{\triangle \varphi_0^2}{I_{np}^2} + \frac{(\varphi_0) - U_{np}}{I_{np}^2} \cdot \triangle I_{np}^4} = \frac{1}{I_{np}^2} \sqrt{I_{np}^2 \cdot (\triangle U_{np}^2 + \triangle \varphi_0^2) + \triangle I_{np}^2 \cdot \ (\varphi_0 - U_{np})^2}$$

ТЧН$= \frac{U_{np} - \varphi_0}{I_{np}}$

$$\triangle \text{ТЧН} = \sqrt{\left(\frac{U_2-U_1}{T_2-T_1}\right)^2_{U_1} \cdot \triangle U_1'^2 + \left(\frac{U_2-U_1}{T_2-T_1}\right)'^2_{U_2} \cdot \triangle U_2^2 + \left(\frac{U_2-U_1}{T_2-T_1}\right)'^2_{T_1} \cdot \triangle T_1^2 + \left(\frac{U_2-U_1}{T_2-T_1}\right)'^2_{T_2} \cdot \triangle T_2^2} =$$

$$= \sqrt{\frac{\triangle U_1^2}{(T_2-T_1)^2} + \frac{\triangle U_2^2}{(T_2-T_1)^2} + \frac{(U_2-U_1)^2 \cdot \triangle T_1^2}{(T_2-T_1)^4} + \frac{(U_2-U_1)^2 \cdot \triangle T_2^2}{(T_2-T_1)^4}} =$$

$$= \frac{1}{(T_2-T_1)^2)} \cdot \sqrt{(\triangle U_1^2 + \triangle U_2^2) \cdot (T_2-T_1)^2 + (\triangle T_1^2 + \triangle T_2^2) \cdot (U_2-U_1)^2}$$

TKI$= e^{\alpha \cdot (T_2 - T_1)}$

$$\triangle TKI = \sqrt{(e^{\alpha \cdot (T_2-T_1)})'^2_{\alpha} \cdot \alpha^2 + (e^{\alpha \cdot (T_2-T_1)})'^2_{T_1} \cdot T_1^2 + (e^{\alpha \cdot (T_2-T_1)})'^2_{T_2} \cdot T_2^2} =$$

$$= e^{\alpha \cdot (T_1+T_2)} \cdot \sqrt{(\triangle \alpha (T_2-T_1))^2 + \alpha^2 (\triangle T_2^2 + \triangle T_1^2)}$$