19.) $R = 20\,\Omega$ $\quad \mathcal{E}_1 = \mathcal{E}_2 = \mathcal{E}$ $\quad R_{b1} = R_{b2} = R_b$ $\quad 0{,}75\,U_{kp} = U_{ks}$

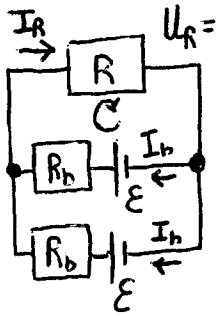
a.) $R_b = ?$ $\qquad$ b.) $\dfrac{P_{Rs}}{P_{Rp}} = ?$

Kirchhoff I. $\boxed{\Sigma I_i = 0}$

Kirchhoff II. $\boxed{\Sigma U_i = 0}$

$\boxed{I = \dfrac{U}{R}}$ $\qquad$ $\boxed{P = \dfrac{U^2}{R}}$

a.)




$\Sigma I_i = 0$

$I_R = I_b + I_b$

(1) $I_R = 2I_b$

hurok: $\Sigma U_i = 0$

$\mathcal{E} - I_b R_b - I_R R = 0$

$U_{kp}$

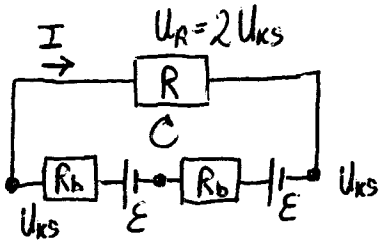
$$I_b = \frac{\mathcal{E} - U_{kp}}{R_b}$$

(1)-be írva:

$$\frac{U_{kp}}{R} = \frac{2(\mathcal{E} - U_{kp})}{R_b}$$

$$R_b U_{kp} = 2\mathcal{E}R - 2U_{kp}R$$

$$U_{kp} = \frac{2\mathcal{E}R}{R_b + 2R} \longrightarrow$$




$$I = \frac{2U_{ks}}{R}$$

hurok: $\Sigma U_i = 0$

$\mathcal{E} - IR_b + \mathcal{E} - IR_b - IR = 0$

$$2\mathcal{E} - 4\frac{U_{ks}}{R}R_b = 2U_{ks}$$

$$2\mathcal{E} = U_{ks}\left(2 + 4\frac{R_b}{R}\right)$$

$$\frac{\mathcal{E}}{1 + 2\frac{R_b}{R}} = U_{ks}$$

$0{,}75\,U_{kp} = U_{ks}$

$$\frac{1{,}5\mathcal{E}R}{R_b + 2R} = \frac{\mathcal{E}}{1 + 2\frac{R_b}{R}}$$

$\Downarrow$

$\underline{\underline{R_b}}$

b.)

$$\frac{P_{Rs}}{P_{Rp}} = \frac{\frac{4U_{ks}^2}{R}}{\frac{U_{kp}^2}{R}} = 4\left(\frac{U_{ks}}{U_{kp}}\right)^2 = \dots$$