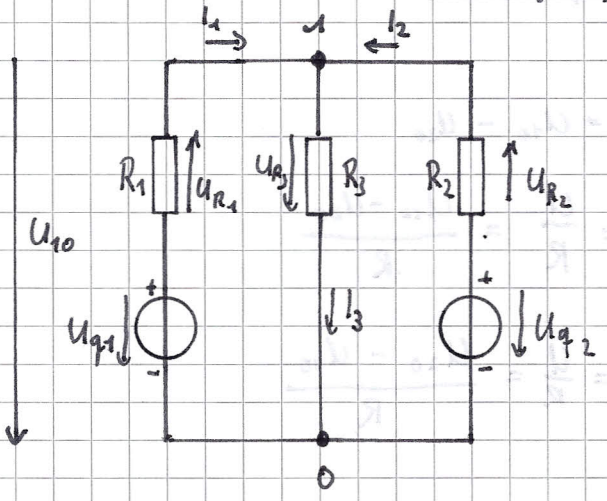
Vorgehensweise

1. Zweigströme festlegen
2. Festlegung des Bezugsknotens
3. K - 1 → Knoten durchnummerieren
4. K - 1 → Knotengleichungen aufstellen
5. Lösen des Gleichungssystems



$R_1 = 1\,\Omega \rightsquigarrow G_1 = 1\,S$

$R_2 = 2\,\Omega \rightsquigarrow G_2 = \frac{1}{2}\,S$

$R_3 = 12\,\Omega \rightsquigarrow G_3 = \frac{1}{12}\,S$

$U_{q1} = 2\,V$

$U_{q2} = 8\,V$

$$I_1 + I_2 - I_3 = 0$$

$$I_1 = (U_{q1} - U_{10}) \cdot G_1$$

$$I_2 = (U_{q2} - U_{10}) \cdot G_2$$

$$I_3 = U_{10} \cdot G_3$$

$$(U_{q1} - U_{10})\,G_1 + (U_{q2} - U_{10})\,G_2 - U_{10}\,G_3 = 0$$

$$U_{q1}\,G_1 - U_{10}\,G_1 + U_{q2}\,G_2 - U_{10}\,G_2 - U_{10}\,G_3 = 0$$

$$-U_{10}\,(G_1 + G_2 + G_3) = -U_{q1}\,G_1 - U_{q2}\,G_2 \quad | \cdot (-1)$$

$$U_{10}\,(G_1 + G_2 + G_3) = U_{q1}\,G_1 + U_{q2}\,G_2 \quad | : (G_1 + G_2 + G_3)$$

$$U_{10} = \frac{U_{q1}\,G_1 + U_{q2}\,G_2}{G_1 + G_2 + G_3}$$