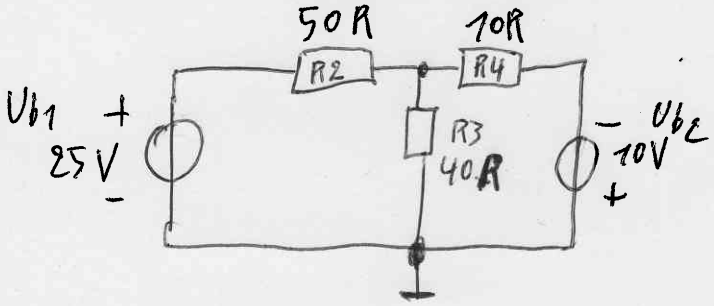
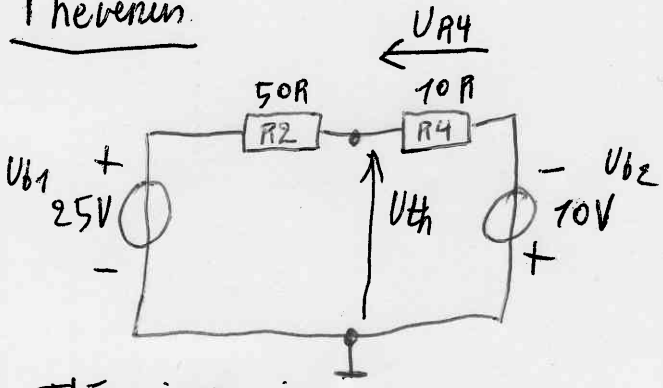
R1 en R5 hebben geen invloed



Thévenin



Théveninspanning

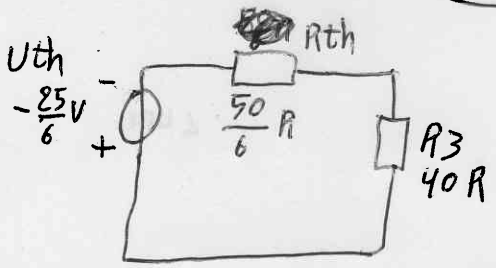
$$U_{R4} = (U_{b1} + U_{b2}) \frac{R4}{R2+R4} = (25V + 10V) \cdot \frac{10}{50+10} = 35 \cdot \frac{10}{60} = \frac{350}{60} = \frac{35}{6} V \ (=5{,}83333V)$$

$$U_{th} = U_{R4} - U_{b2} = \frac{35}{6} V - 10V = \frac{35}{6} V - \frac{60}{6} V = -\frac{25}{6} V \ (=-4{,}16666V)$$

Théveninweerstand (bronspanningen kortsluiten)

$$R_{th} = \frac{R2 \cdot R4}{R2+R4} = \frac{50R \cdot 10R}{50R+10R} = \frac{500}{60} R = \frac{50}{6} R \ (=8{,}3333R)$$

Thévenin schema (nu sluiten we R3 aan)



$$U_{R3} = U_{th} \frac{R3}{R_{th}+R3} = -\frac{25}{6} V \cdot \frac{40R}{\frac{50}{6}R + 40R} = -\frac{25}{6} V \cdot \frac{40R}{\frac{50}{6}R + \frac{240}{6}R}$$

$$= -\frac{25}{6} R \cdot \frac{40R}{\frac{290}{6}R} = -\frac{25}{6} R \cdot \frac{40R \cdot 6}{290} = -\frac{25}{6} R \cdot \frac{240}{290} = -\frac{6000}{1740} V$$

$$= -\frac{300}{87} V$$

$$U_{R3} = -3{,}4482758 \ V$$