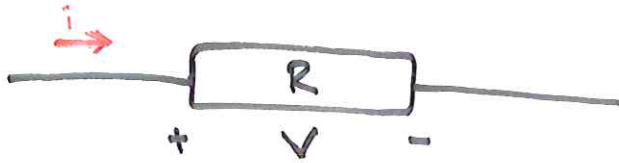


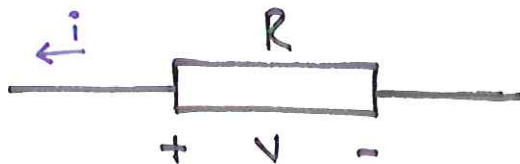
KAPITEL 1

1.1 Bestäm strömmen i .



svär: $i = \frac{V}{R}$

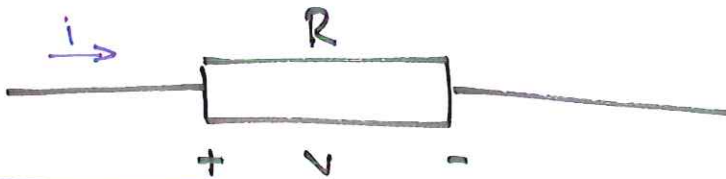
1.2



svär: $i = -\frac{V}{R}$

positiv ström åt vänster är
samma sak som negativ ström
åt höger

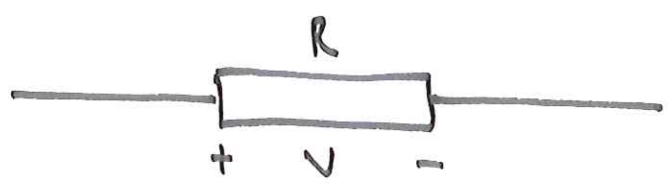
1.3



$V = 6V, R = 3000\Omega$

svär: $i = \frac{V}{R} = 2mA$

1.4

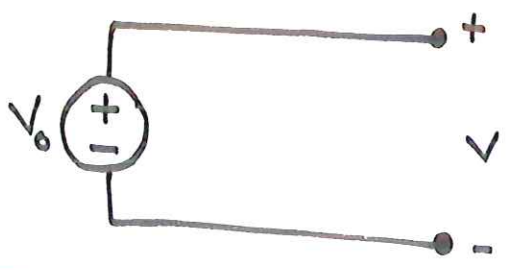


$V = 6V$,
 $R = 3k\Omega$

\Rightarrow svar: $i = -\frac{V}{R} = -2mA$

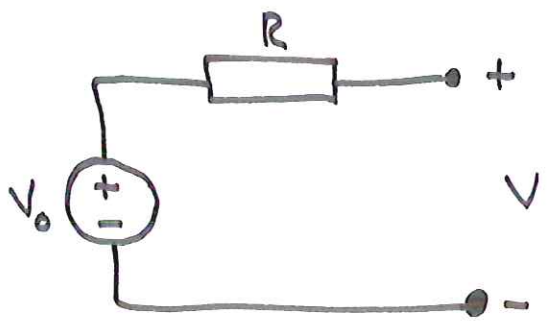
1.5

Bestäm spänningen V



svär: Vi har samma spänning överallt, $V = V_0$

1.6

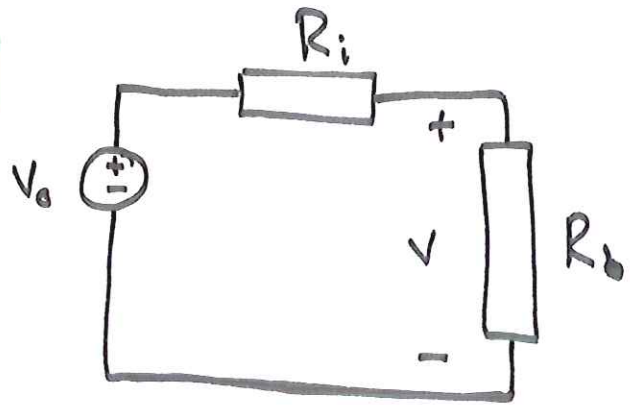


Vi har en öppen krets, vilket innebär att ingen ström flyter i kretsen.

svär: $V = V_0$

1.7

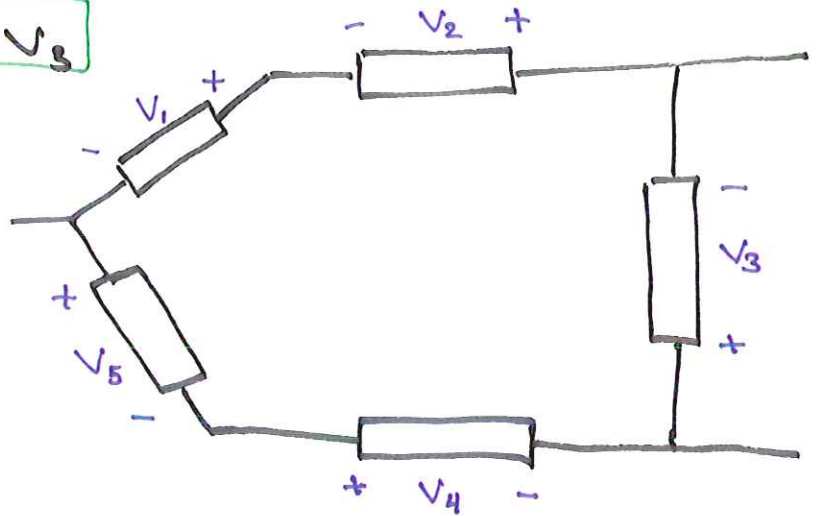
a) Bestäm spänningen v



b) $v = \lim_{R_b \rightarrow \infty} \frac{R_b}{R_i + R_b} V_0 = V_0$ (öppen krets)

1.8 Bestäm spänningen v_3

$v_1 = 6V$
 $v_2 = -4V$
 $v_3 = ?$
 $v_4 = 1V$
 $v_5 = 10V$

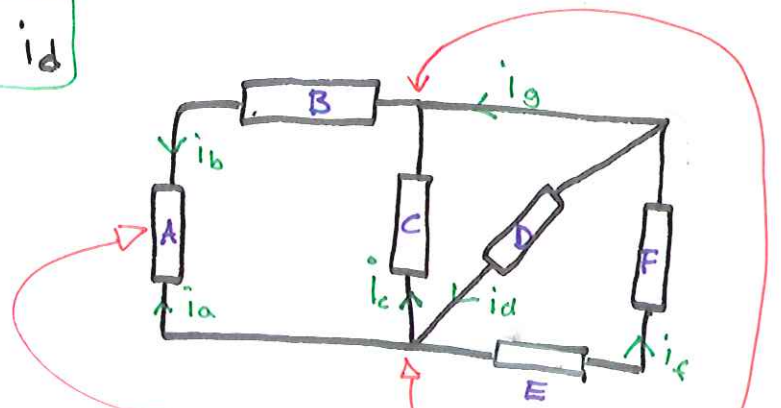


$$v_1 + v_2 + v_3 + v_4 + v_5 = 0$$

$$\Leftrightarrow v_3 = -v_1 - v_2 - v_4 - v_5 = -6 + 4 - 1 - 10 = -13V$$

1.11 Bestäm i_a , i_c och i_d

$$\begin{aligned} i_b &= 1 \text{ A} \\ i_g &= 3 \text{ A} \\ i_f &= 1 \text{ A} \end{aligned}$$



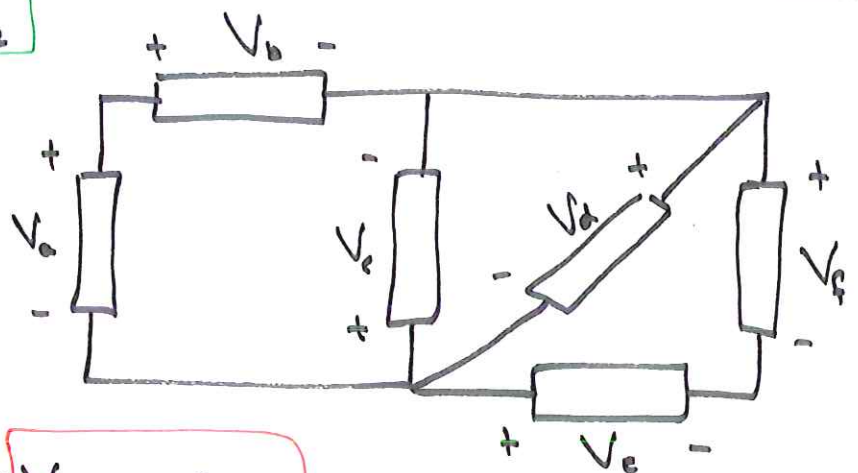
Vi ser direkt att $i_a = -i_b = -1 \text{ A}$

$$i_b - i_c - i_g = 0 \Rightarrow i_c = i_b - i_g = 1 - 3 = -2 \text{ A}$$

$$i_a + i_e + i_f - i_d = 0 \Rightarrow i_d = i_a + i_e + i_f = -1 - 2 + 1 = -2 \text{ A}$$

1.13 Bestäm V_a , V_d , V_e

$$\begin{aligned} V_b &= 1 \text{ V} \\ V_c &= 3 \text{ V} \\ V_f &= 2 \text{ V} \end{aligned}$$



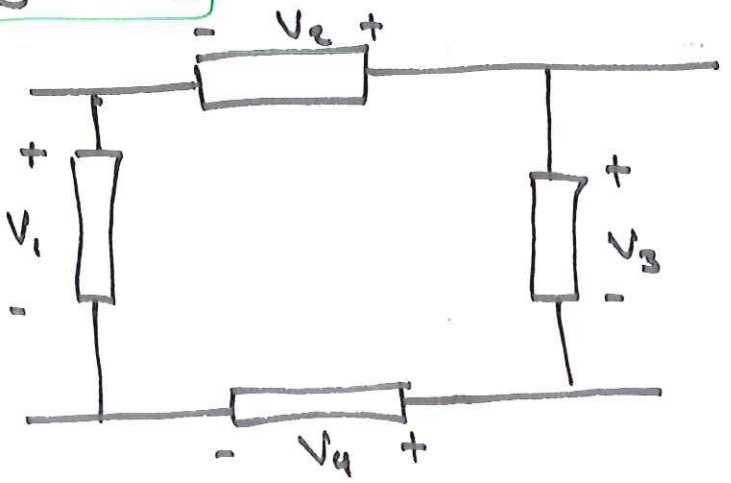
$$V_a - V_b + V_c = 0 \Rightarrow V_a = -2 \text{ V}$$

$$V_c + V_d = 0 \Rightarrow V_d = -3 \text{ V}$$

$$V_d - V_f + V_e = 0 \Rightarrow V_e = 5 \text{ V}$$

1.15 Bestäm spänningen V_3

$V_1 = -3V$
 $V_2 = 5V$
 $V_4 = 2V$

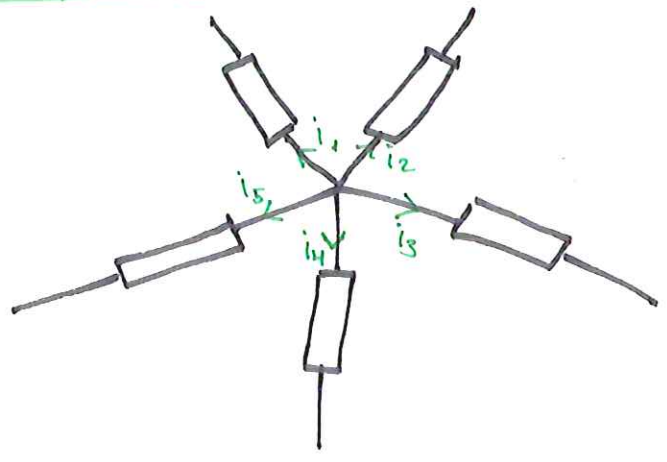


$V_1 + V_2 - V_3 - V_4 = 0$

$\Leftrightarrow V_3 = V_1 + V_2 - V_4 = -3V + 5V - 2V = 0V$

1.17 Bestäm strömmen i_4

$i_1 = 5mA$
 $i_2 = 15mA$
 $i_3 = -7mA$
 $i_5 = 10mA$

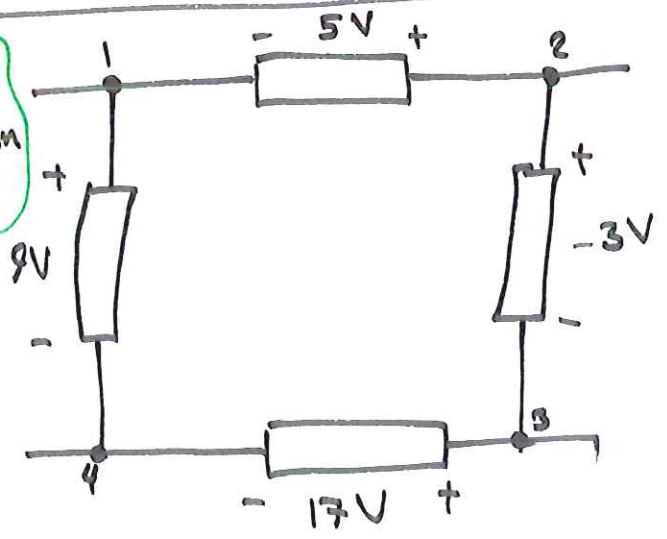


$i_1 + i_2 + i_3 + i_4 + i_5 = 0$

$\Leftrightarrow i_4 = -23mA$

1.16 Bestäm potentialen i nod 3 om potentialen i nod 1.

- Nod 1: $V_1 = 0$
- Nod 2: $V_2 = 0 + 5V$
- Nod 3: $V_3 = 5V - 3V = 8V$
- Nod 4: $V_4 = 8V - 17V = -9V$
- Nod 1: $V_1 = -9V + 9V$



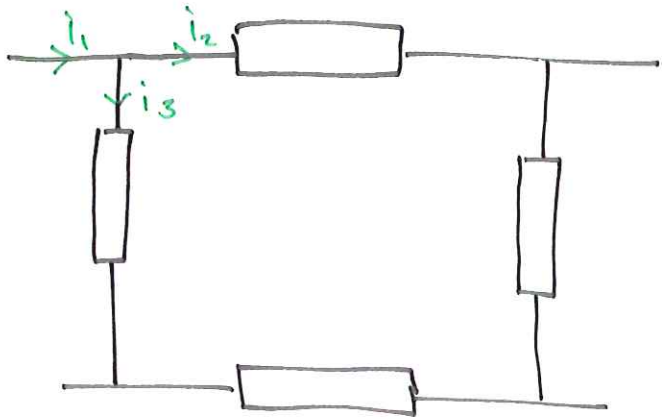
1.18 Bestäm strömmen i_3

$$i_1 = 500 \mu\text{A}$$

$$i_2 = 2 \text{ mA}$$

$$i_1 + i_3 - i_2 = 0$$

$$\Leftrightarrow i_3 = i_2 - i_1 = -1.5 \text{ mA}$$



11.20 Bestäm effekten P

$$V_a = Ri$$

$$V_0 = (R + R_e)i$$

där R_e ges av:

$$\frac{1}{R_e} = \frac{1}{2R} + \frac{1}{2R} \Rightarrow R_e = R$$

$$\Rightarrow V_0 = (R + R)i = 2Ri = 2V_a$$

Effekten P ges av:

$$P_a = V_a \cdot i = V_a \cdot \frac{V_a}{R} = \frac{V_a^2}{R} = \frac{(\frac{1}{2}V_0)^2}{R} = \frac{V_0^2}{4R}$$

