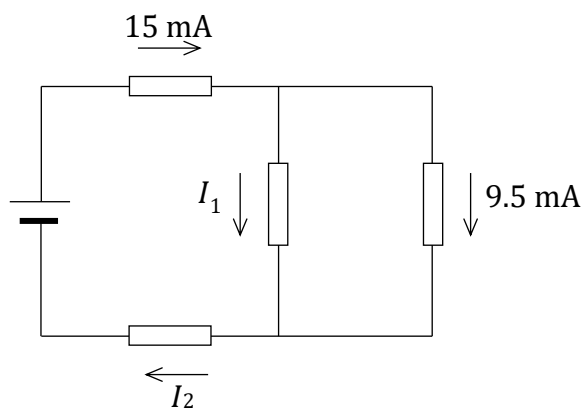


第 19 課：基爾霍夫定理

1. 求下列各圖中未知的電流。

(a)

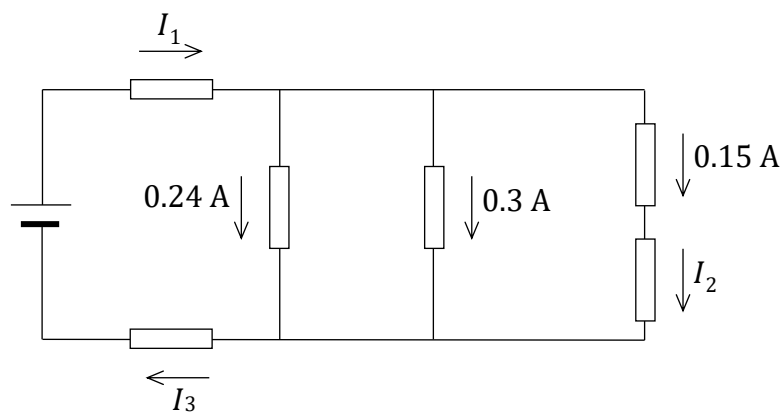


$$I_2 = 15\text{ mA}$$

$$I_1 + 9.5 = 15$$

$$I_1 = 5.5\text{ mA}$$

(b)



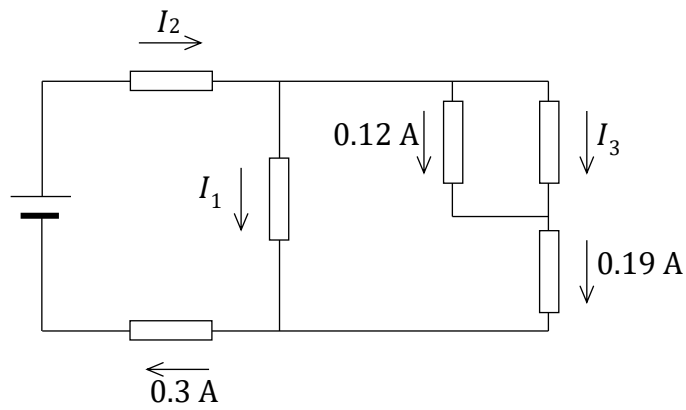
$$I_2 = 0.15\text{ A}$$

$$I_1 = 0.24 + 0.3 + 0.15$$

$$= 0.69\text{ A}$$

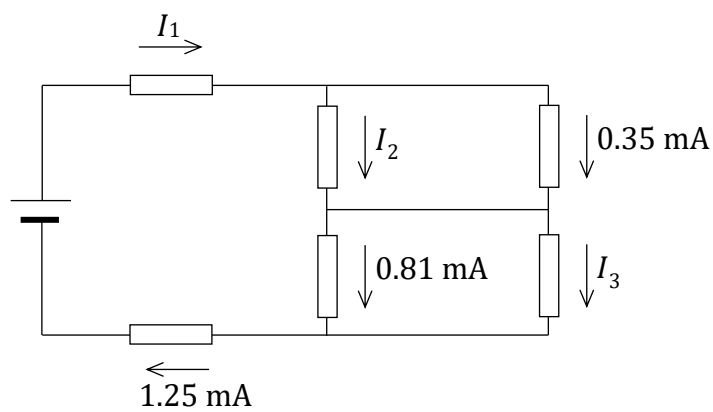
$$I_3 = 0.69\text{ A}$$

(c)



$$\begin{aligned} I_2 &= 0.3 \text{ A} \\ I_3 + 0.12 &= 0.19 \\ I_3 &= 0.07 \text{ A} \\ I_1 + 0.19 &= 0.3 \\ I_1 &= 0.11 \text{ A} \end{aligned}$$

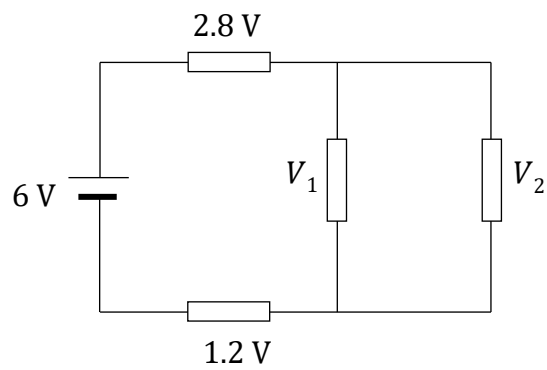
(d)



$$\begin{aligned} I_1 &= 1.25 \text{ mA} \\ I_2 + 0.35 &= 1.25 \\ I_2 &= 0.9 \text{ mA} \\ I_3 + 0.81 &= 1.25 \\ I_3 &= 0.44 \text{ mA} \end{aligned}$$

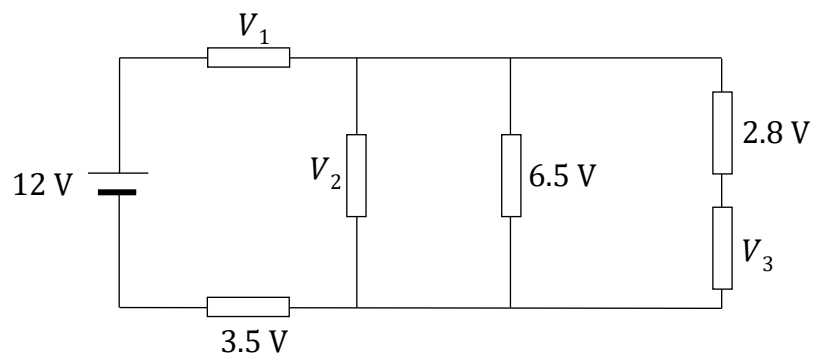
2. 求下列各圖中未知的電壓。

(a)



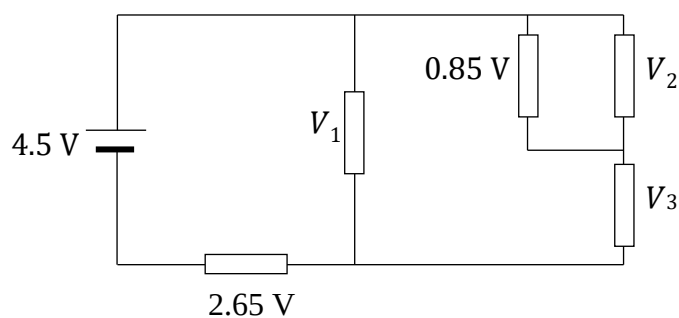
$$\begin{aligned} 2.8 + V_1 + 1.2 &= 6 \\ V_1 &= 2 \text{ V} \\ V_2 &= 2 \text{ V} \end{aligned}$$

(b)



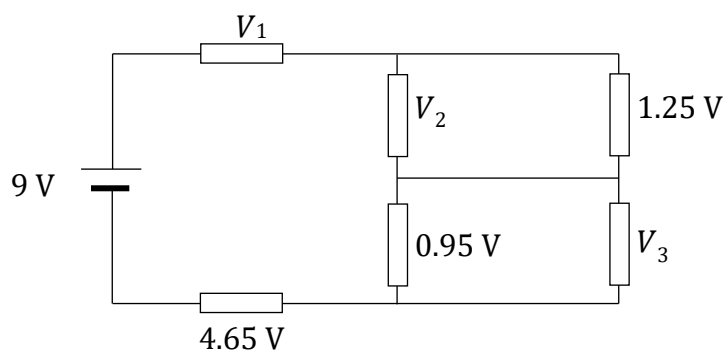
$$\begin{aligned}V_1 + 6.5 + 3.5 &= 12 \\V_1 &= 2 \text{ V} \\2 + V_2 + 3.5 &= 12 \\V_2 &= 6.5 \text{ V} \\2 + 2.8 + V_3 + 3.5 &= 12 \\V_3 &= 3.7 \text{ V}\end{aligned}$$

(c)



$$\begin{aligned}V_1 + 2.65 &= 4.5 \\V_1 &= 1.85 \text{ V} \\0.85 + V_3 + 2.65 &= 4.5 \\V_3 &= 1 \text{ V} \\V_2 + 1 + 2.65 &= 4.5 \\V_2 &= 0.85 \text{ V}\end{aligned}$$

(d)



$$\begin{aligned}V_1 + 1.25 + 0.95 + 4.65 &= 9 \\V_1 &= 2.15 \text{ V} \\2.15 + V_2 + 0.95 + 4.65 &= 9 \\V_2 &= 1.25 \text{ V} \\2.15 + 1.25 + V_3 + 4.65 &= 9 \\V_3 &= 0.95 \text{ V}\end{aligned}$$