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50 Y → Δ

$$\frac{R_1 R_2 + \dots}{24}$$

$$\frac{R_A - R_C}{R_A + R_B + R_C}$$

所有答案請以科學符號表示，例如：

計算出來的答案為 $\frac{1}{3}$ ，則填寫 3.33×10^{-1} (科學符號的小數第三位，四捨五入進第二位)，

計算出來的答案為 $-\frac{2}{3}$ 則填寫 -6.67×10^{-1} (科學符號的小數第三位，四捨五入進第二位)

計算出來的答案為 7，則 7.00×10^0

計算出來的答案為 -7，則 -7.00×10^0

計算出來的答案為 70，則 7.00×10^1

如還不知道怎麼填寫答案，請詢問監考人員，答案以原子筆填寫，每個答案五分

$$I = \frac{V}{R}$$

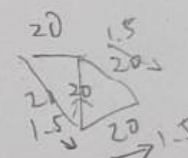
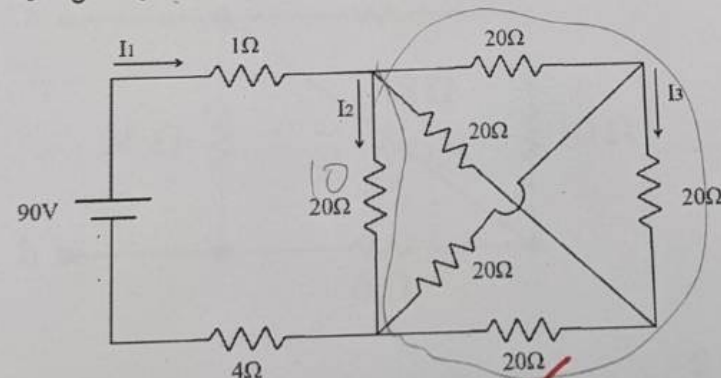
$$V = IR$$

$$\frac{90}{15} = 6$$

求下圖中電流 $I_1 = 6.00 \times 10^0$ 安培， $I_2 = 3.00 \times 10^0$ 安培，

$I_3 = 0.00 \times 10^0$ 安培

15Ω



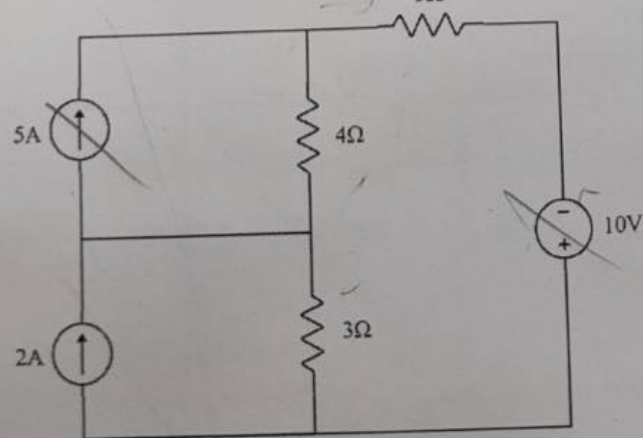
$$20 // 20 + 20 // 20$$

$$\frac{20}{20+20}$$

圖中 5Ω 電阻消耗的功率為 3.00×10^0 瓦特

$$4.50 \times 10^1$$

$$P = IV = I^2 R$$



12Ω

$$10V \quad I_1 = \frac{10}{12} \quad I_2 = \frac{5}{3}$$

$$\frac{3}{4+3} = \frac{1}{4}$$

$$\frac{10}{12} + \frac{20}{12} + \dots$$

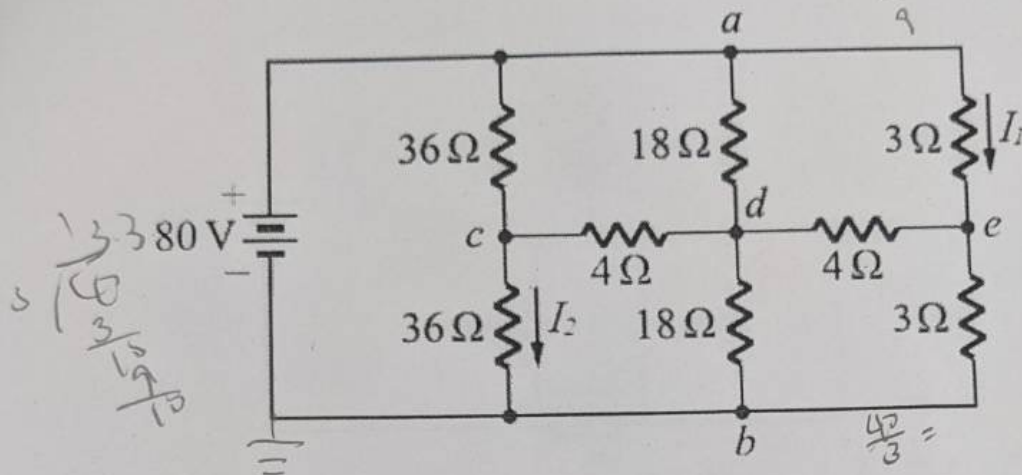
$$3 \times 5 = 45 W$$

$$\frac{36}{1}$$

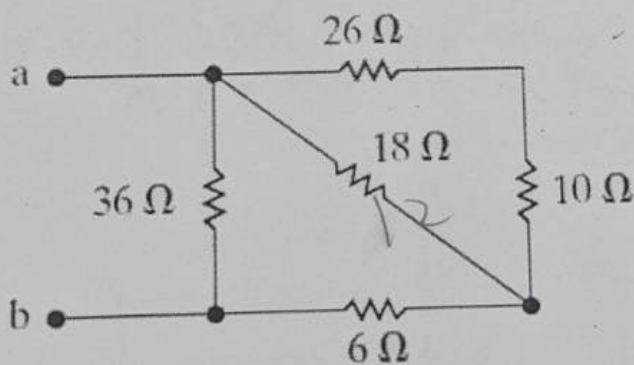
-50

如下圖所示之電路，電路中 $I_1 = 0.33 \times 10^{-1}$ 安培，

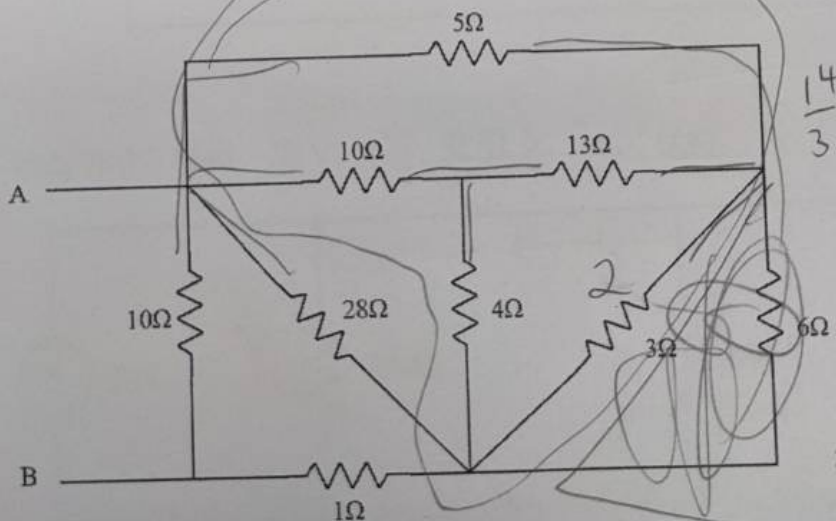
$I_2 = 0.44 \times 10^{-1}$ 安培



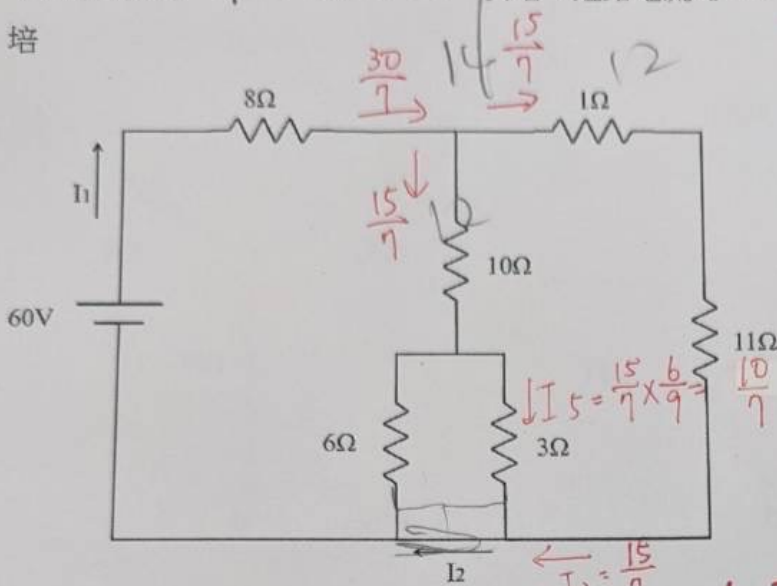
如下圖所示的電路，a、b 兩端所看到的等效電阻為 $0.20 \times 10^{-1} \Omega$



求下圖中 AB 兩端的等效電阻為 $3.33 \times 10^{-1} \Omega$

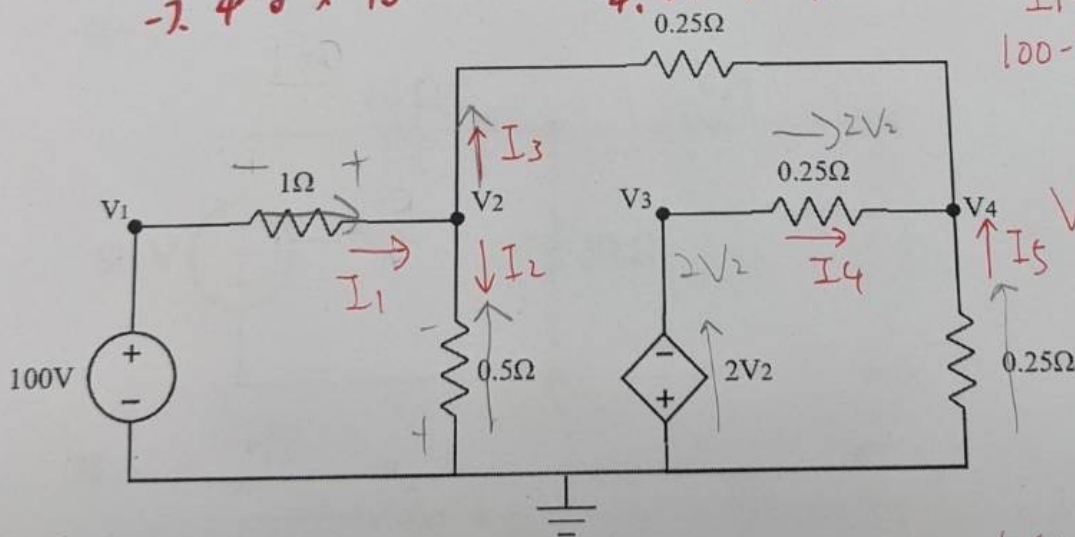


下圖中電流 $I_1 = 4.28 \times 10^{-3}$ 安培，短路電流 $I_2 = 0.00 \times 10^{-3}$ 安培

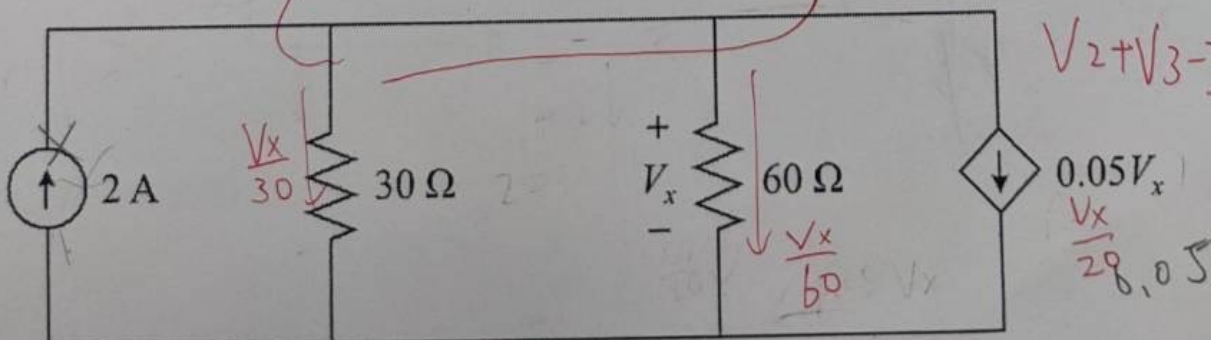


求電路中的電壓 $V_1 = 1.00 \times 10^1$ 伏特、 $V_2 = 6.67 \times 10^1$ 伏

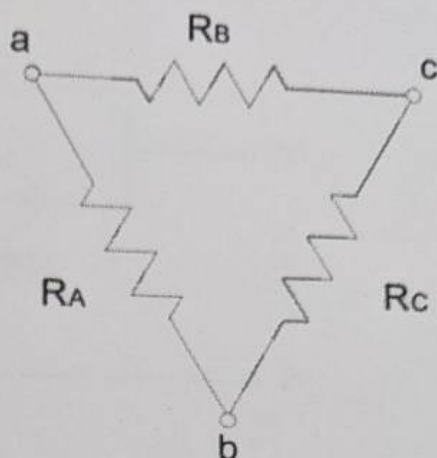
特、 $V_3 = 1.23 \times 10^1$ 伏特、 $V_4 = 4.00 \times 10^0$ 伏特



如圖所示之電路，求 $V_x = 2.00 \times 10^1$ 伏特




R3 為 3 歐姆，求 $R_C = 0.003 \times 10^3 \Omega$



$V_{th} = 8.00 \times 10^1$ 伏特及等效電阻 $R_{th} = 1.87 \times 10^0 \Omega$

Diagram for Problem 1: A circuit with an 80 V DC voltage source in series with a $10\ \Omega$ resistor. This is followed by a parallel branch with a $30\ \Omega$ resistor. The main path continues through a $2.5\ \Omega$ resistor to terminals a and b. A load resistor is connected across terminals a and b.

R_{th}
 $10 \text{ M}\Omega$
 $25 \text{ M}\Omega$
 a
 30
 $80 \text{ K}\Omega$
 b
 $R_{th} = 10 \text{ M}\Omega$

V_{th} 10 Ω ~~25 Ω~~ 设电流 i

 30Ω i b

$$V_{th} = 80 \times \frac{30}{10+30} = 60V$$

$$\frac{300}{40} = \frac{15}{2}$$
$$\frac{15}{4}$$

$$\frac{15}{2} + \frac{5}{2}$$
$$\frac{20}{2}$$

$$\frac{15}{40} \quad \frac{15}{8}$$

$$\begin{array}{r} 1.875 \\ 8 \overline{) 15} \\ \underline{8} \\ 70 \\ \underline{64} \\ 60 \\ \underline{56} \\ 4 \end{array}$$

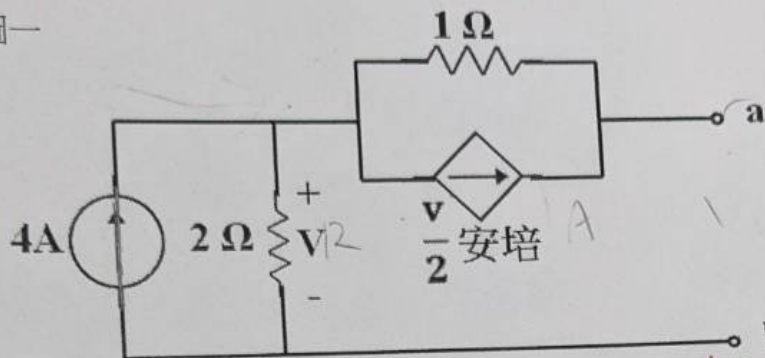
下圖一中的電路可以諾頓等效電路簡化為圖二中的電路，

則 I_N 為 $\square \cdot \square \times 10^{\square}$ 安培， R_N 為 $\square \cdot \square \times 10^{\square} \Omega$ 。

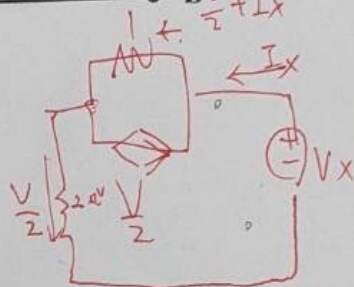
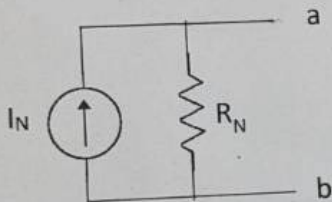
3. $\dots \times 10^{\dots}$

4. $\dots \times 10^{\dots}$

圖一



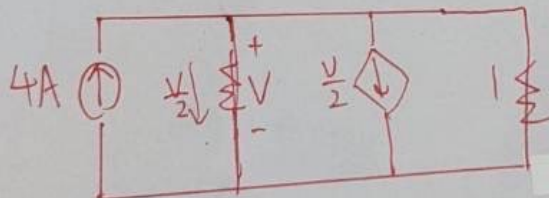
圖二



$$\frac{V}{2} + I_x = \frac{V}{2} + \frac{V}{2} \quad \text{--- (1)}$$

$$V_x = V + \frac{V}{2} + I_x \quad \text{--- (2)}$$

$$I_x = \frac{V}{2}$$



$$4 = \frac{V}{2} + \frac{V}{2} + V$$

$$V = 2V$$

$$I_N = \frac{3}{2}V = 3A$$

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計算出來的答案為7，則 7.00×10^0

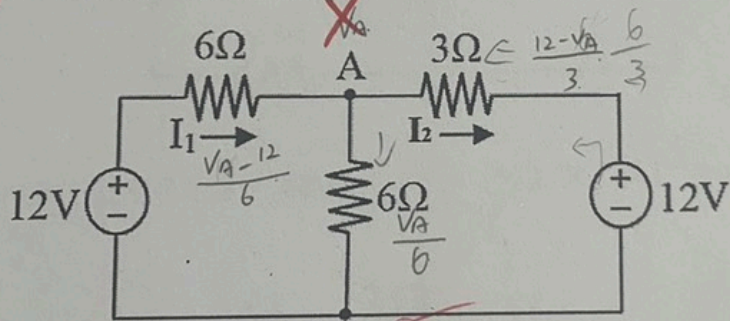
計算出來的答案為-7，則 -7.00×10^0

計算出來的答案為70，則 7.00×10^1

如還不知道怎麼填寫答案，請詢問監考人員

答案以原子筆填寫，每個答案五分

1. 下圖電路中電流 $I_1 = 4.00 \times 10^{-2}$ 安培與電流 $I_2 = 4.00 \times 10^{-2}$ 安培



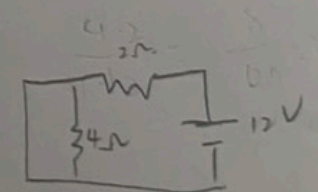
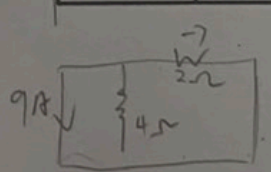
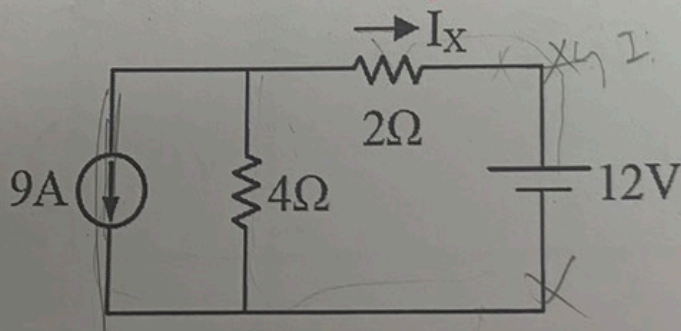
$$\frac{V_A - 12}{6} = \frac{V_A}{6} + \frac{12 - V_A}{3}$$

$$V_A - 12 = V_A + 24 - 2V_A$$

$$2V_A = 36$$

$$V_A = 18$$

2. 如下圖所示，試求電流 $I_x = 4.00 \times 10^{-2}$ 安培



$$R = 6\Omega$$

$$86V$$

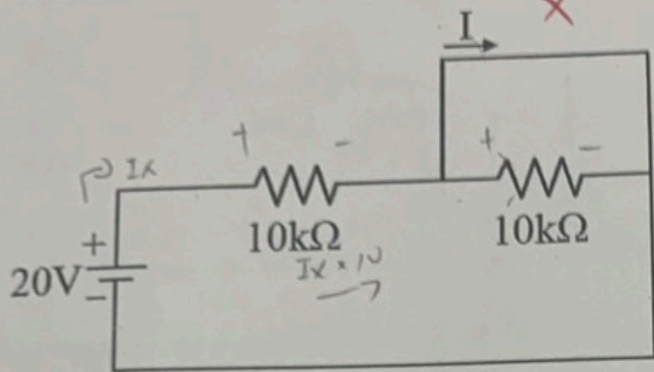
$$60\Omega$$

$$I = 2$$

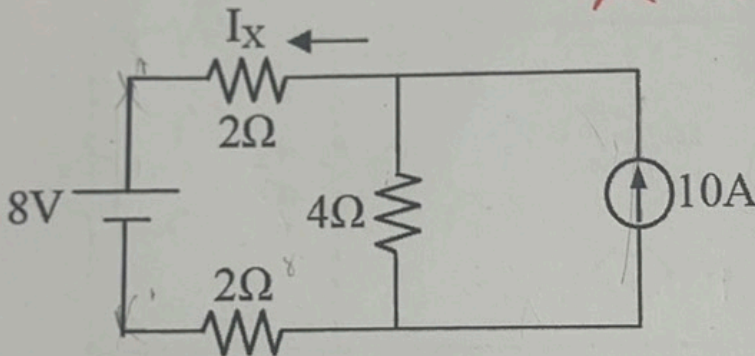
$$V_x = 36$$

$$6 \times \frac{4}{4+2} = 8$$

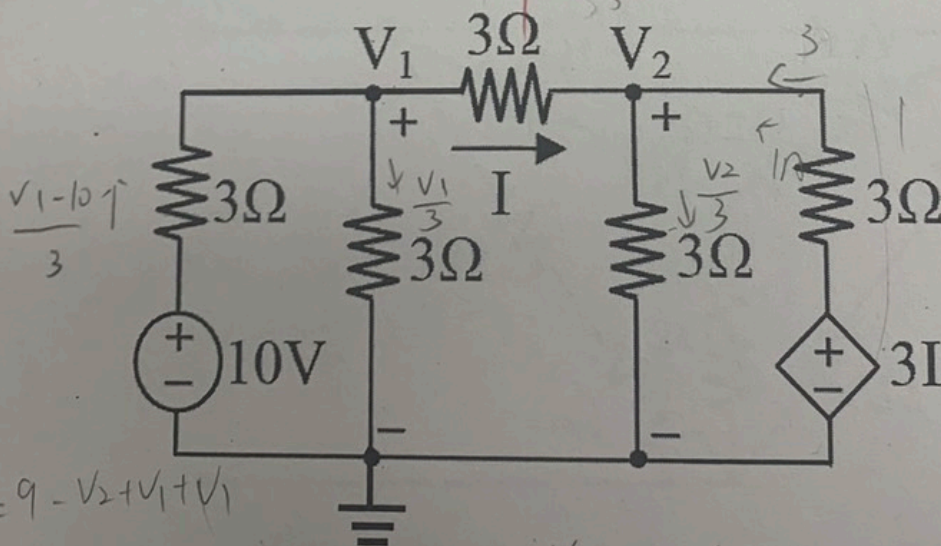
-2 3. 如下圖所示，試求電流 $I = \square, \square \times 10^{\square}$ 安培



-5 4. 如下圖所示，試求流經 2 歐姆電阻的電流 $I_x = \square, \square \times 10^{\square}$ 安培



-10 5. 如下圖所示電路，求電壓 $V_1 = \square, \square \times 10^{\square}$ 伏特， $V_2 = \square, \square \times 10^{\square}$ 伏特



$$V_1 - 10 = V_2 - V_1 - 9 + 10V_1$$

$$V_1 - V_2 = 1$$

$$V_1 - 10 = 3 - V_2 + V_1$$

$$V_1 - V_2 = 13$$

$$V_1 - 10 = 9 - V_2 + V_1 + V_1$$

$$\frac{V_1 - 10}{3} = 3 - \left(\frac{V_2 - V_1}{3}\right) + \frac{V_1}{3}$$

$$3 - \frac{V_2 - V_1}{3} + 3 = \frac{V_2}{3}$$

$$18 - V_2 + V_1 = V_2$$

$$V_1: \frac{V_1 - 10}{3} = \frac{V_2 - V_1}{3} + \frac{V_1}{3}$$

$$V_2: \frac{V_2 - V_1}{3} + 1 = \frac{V_2}{3}$$

$$2V_2 - V_1 = 18$$

$$V_1 - V_2 = 10$$

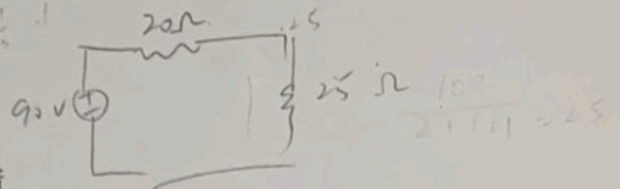
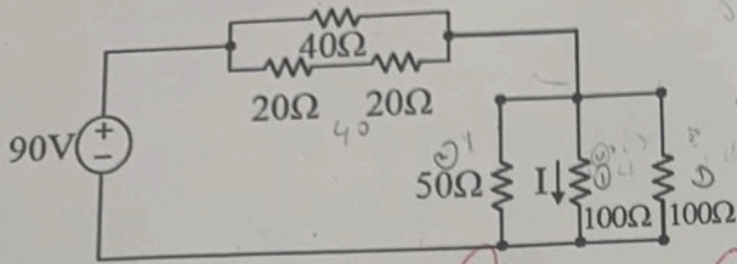
$$V_2 - V_1 + 3 = V_2$$

$$V_2 - V_1 = 3$$

$$V_2 = -1$$

$$V_1 = 20$$

6. 如下圖所示，試求電流 $I = \boxed{5.00} \times 10^{-2}$ 安培



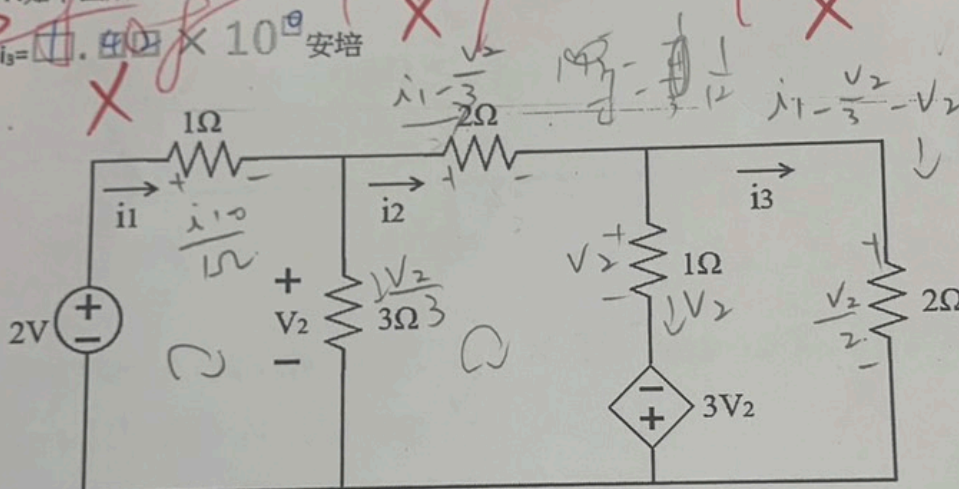
$$I = 2A$$

$$2 \times \frac{50}{250} = \frac{2}{5} = 0.4$$

$$\frac{100 \times 50}{100 + 50} = \frac{5000}{150} = 33.33$$

$$\frac{100}{5} + 10 = 20 + 10 = 30$$

7. 如下圖所示，試求電流 $i_1 = \boxed{1.5} \times 10^{-2}$ 安培， $i_2 = \boxed{6.7} \times 10^{-2}$ 安培， $i_3 = \boxed{4.0} \times 10^{-2}$ 安培



$$8V_2 = 2V_2 \Rightarrow V_2 = 0$$

$$24V_2 = 3i_1 - V_2 + V_2$$

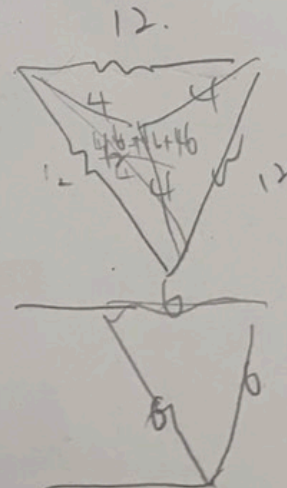
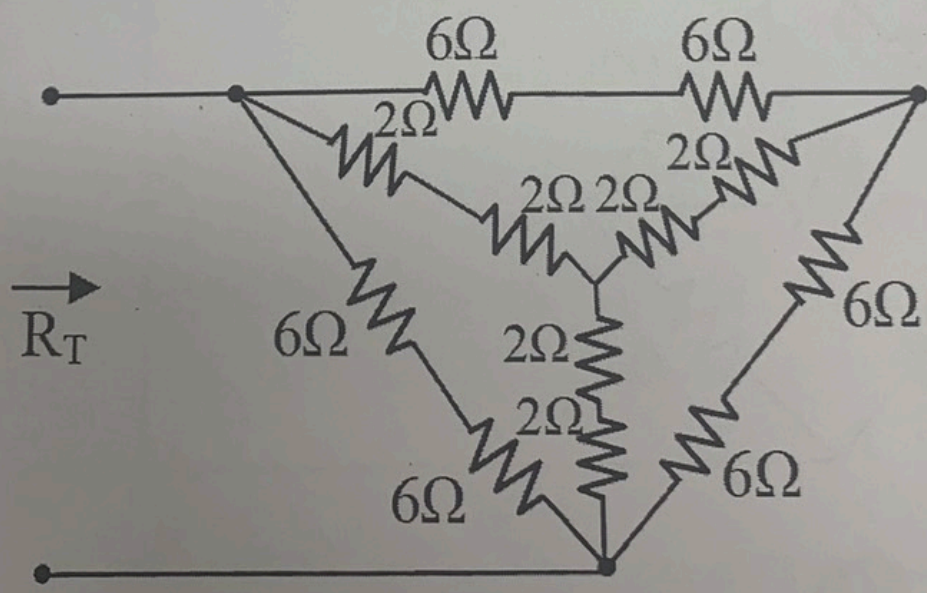
$$21V_2 = 3i_1$$

$$i_1 = 7V_2$$

$$\frac{21-1}{12} \cdot \frac{20}{12} = \frac{10}{6} = \frac{5}{3}$$

$$\frac{5}{3} \cdot \frac{1}{4} \cdot \frac{20-3}{12} = \frac{17}{12}$$

8. 如下圖示電路，等效電阻 $R_T = \boxed{4.00} \times 10^0 \Omega$



$$12 // 6$$

$$\frac{12 \times 6}{12 + 6} = \frac{72}{18} = 4$$

$$7. \frac{-2}{3}V_4 + 3V_4 = 100$$

$$\frac{-14}{3}V_4 + 3V_4 = 100$$

$$\frac{-2}{3}V_4 = 100$$

$$V_2 = 100$$

$$\frac{-150}{3} = \frac{3}{2}V_4$$

$$V_4 = 100$$

$$V_1 = 100 = I_1 = 100$$

$$V_2 = I_1 = I_3 - I_2$$

$$V_3 = -2V_2$$

$$V_4 = I_4 + I_5 + I_3 = 0$$

9. 如下圖所示電路，求電壓 $V_2 = \boxed{100} \times 10^3$ 伏特， $V_3 = \boxed{100} \times 10^3$ 伏特， $V_4 = \boxed{100} \times 10^3$ 伏特

特， $V_4 = \boxed{100} \times 10^3$ 伏特

$$V_2 - 100 = 4V_4 - 4V_2 - 2V_2$$

$$7V_2 - 4V_4 = 100$$

$$7V_3 + 7V_4 - 4V_4 = 100$$

$$7V_3 + 3V_4 = 100$$

$$V_3 = \frac{100 - 3V_4}{7}$$

$$V_3 = -2V_2$$

$$V_3 = -2V_2$$

$$V_3 = -2V_2$$

$$V_3 = -2V_2$$

$$V_3 = -2V_2$$

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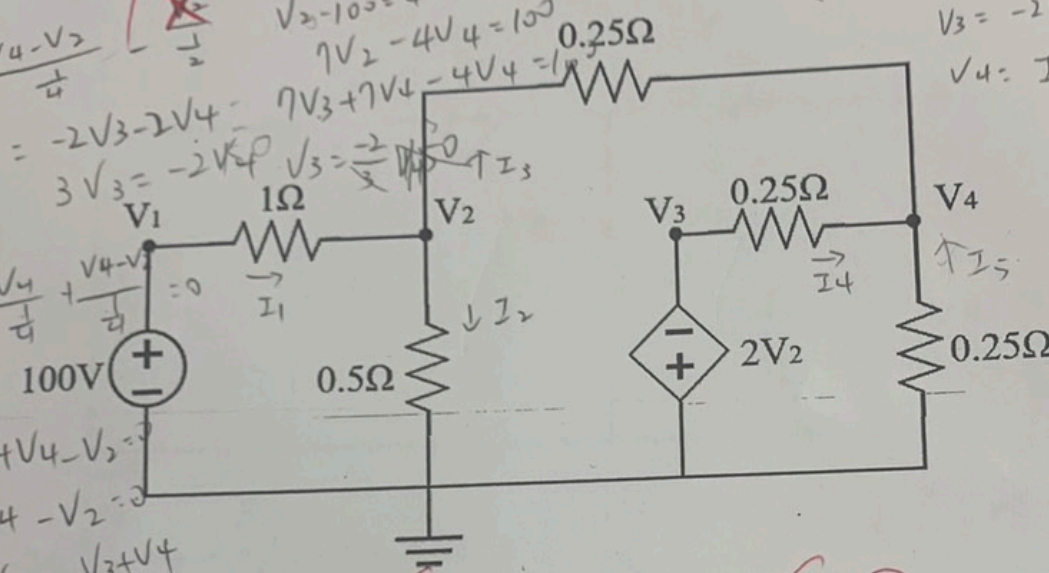
$$V_3 = -2V_2$$

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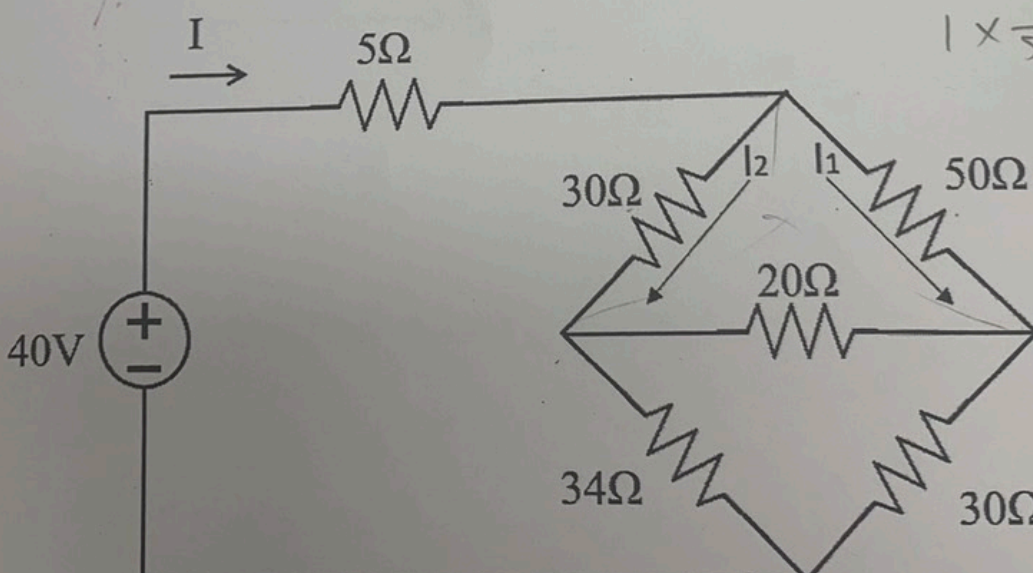
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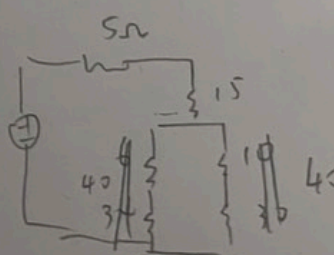
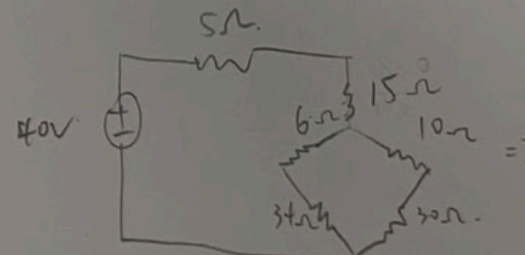


10. 如下圖所示，試求電流 $I_1 = \boxed{3.75} \times 10^{-2}$ 安培， $I_2 = \boxed{6.25} \times 10^{-2}$ 安培， $I = \boxed{10} \times 10^{-2}$ 安培



$$1 \times \frac{30}{50+30} = 1 \times \frac{3}{8} I_1$$

$$8 \overline{) 30} \begin{array}{r} 3 \\ 24 \\ \hline 60 \\ 56 \\ \hline 40 \end{array}$$



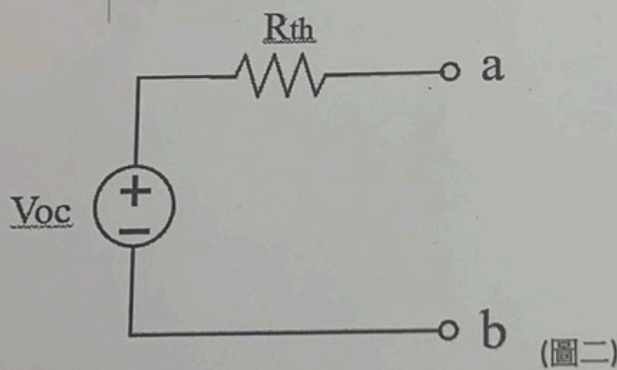
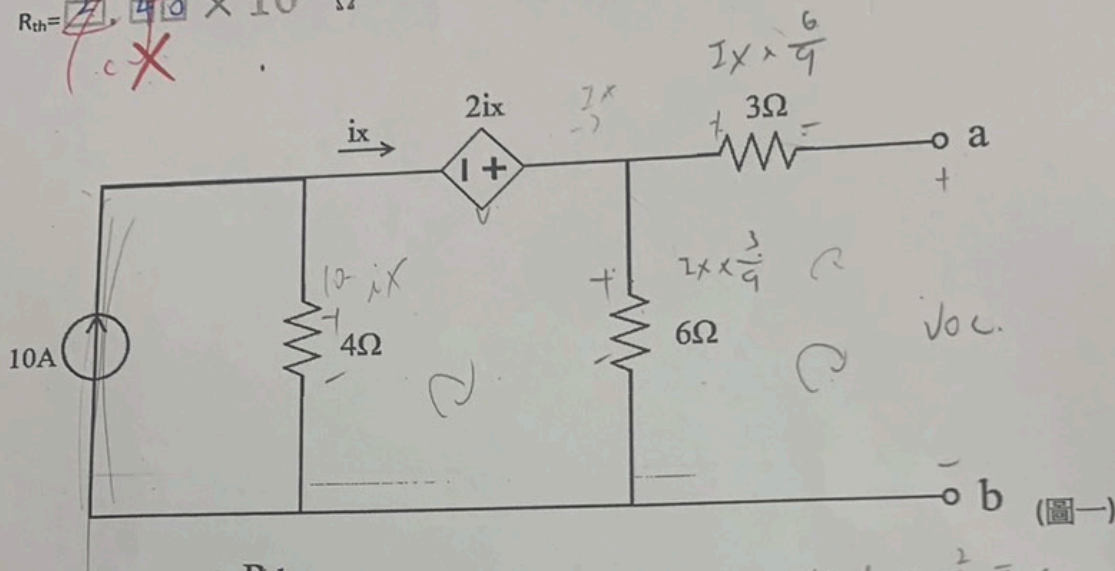
$$40 \parallel 40 = 20$$

$$\frac{40 \times 40}{40+40} = 20$$

$$5+15+20=40$$

11. (圖二) 為 (圖一) 之戴維寧等效電路，則 $V_{oc} = \boxed{4} \times 10^3$ 伏特，

$R_{th} = \boxed{2.4} \times 10^3 \Omega$



$$\frac{6 \times 4}{6 + 4} = 2.4 \Omega$$

$$\frac{2}{3} I_x + V_{oc} = \frac{10}{3} I_x$$

$$V_{oc} = \frac{1}{3} I_x \times 4$$

$$40 - 4ix + 2ix = \frac{1}{3} ix$$

$$120 - 12ix + 3ix = ix$$

$$120 = 10ix$$

$$ix = 12$$