

# 生機系電工學第二次隨堂練習 2012/03/14

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1. Determine the unknown quantities for the networks in Fig. 1.

$$P = I^2 R_2 = 9 \times R_2 = 45W \rightarrow R_2 = 5\Omega$$

$$R_1 = \frac{12V}{3A} = 4\Omega$$

$$R_T = R_1 + R_2 + R_3 = 17\Omega$$

$$E_2 - 20V = I \times R_T = (3A)(17\Omega) = 51V$$

$$E_2 = 71V$$

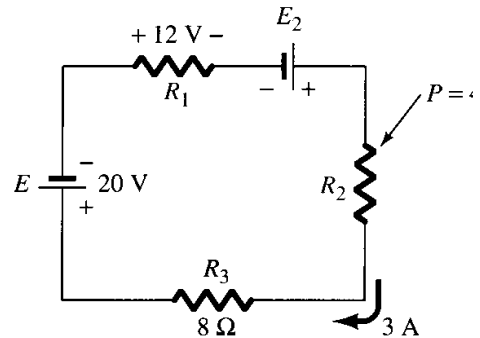


Fig. 1.

2. Determine the unknown voltage for the circuit in Fig. 2. using Kirchoff's voltage law.

$$16V - 5V + 12V - V_3 = 0 \quad V_3 = 23V$$

$$V_4 = 16V - 5V = 11V \quad V_5 = V_3 = 23V$$

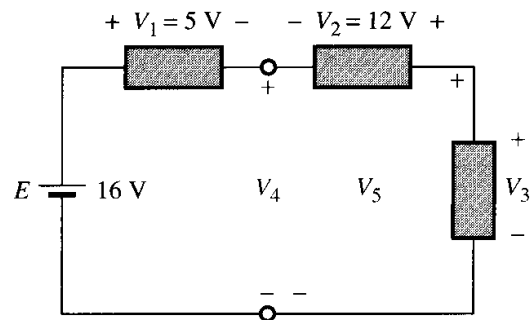


Fig.2.

3. Determine the unknown quantities for the networks in Fig. 3.

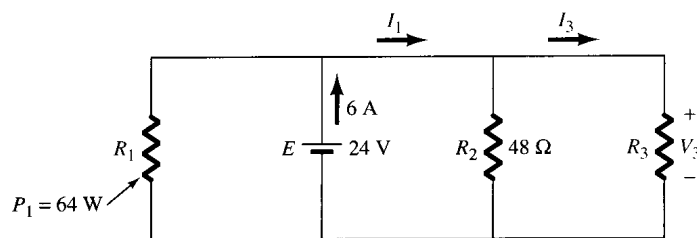


Fig. 3.

$$V_1 = V_2 = V_3 = E = 24V \quad I_2 = \frac{V_2}{R_2} = \frac{24V}{48\Omega} = 0.5A$$

$$P_1 = \frac{V_1^2}{R_1} = 64W \rightarrow R_1 = 9\Omega \quad I = \frac{E}{R_T} = \frac{24V}{R_T} = 6A \rightarrow R_T = 4\Omega$$

$$R_T = R_1 // R_2 // R_3 = 4\Omega \rightarrow R_1 = 8.471\Omega$$

$$I_3 = \frac{V_3}{R_3} = \frac{24V}{8.471\Omega} = 2.833A \quad I_1 = I_2 + I_3 = 3.333A$$