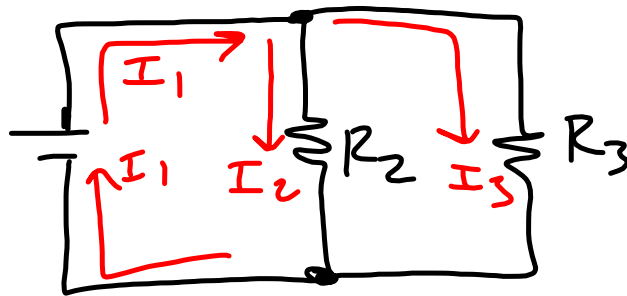


1)



$$I_1 = I_2 + I_3$$

$$V_{\text{total}} = 24 \text{ V}$$

$$V_2 = 24 \text{ V}$$

$$V_3 = 24 \text{ V}$$

$$I_1 = 6 \text{ A}$$

$$I_2 = \frac{24 \text{ V}}{8 \Omega} = 3 \text{ A}$$

$$I_3 = \frac{24 \text{ V}}{8 \Omega} = 3 \text{ A}$$

$$R_{\text{eq}} = 4 \Omega$$

$$R_2 = 8 \Omega$$

$$R_3 = 8 \Omega$$

$$P_{\text{total}} = \frac{(24 \text{ V})(6 \text{ A})}{144 \text{ W}}$$

$$P_2 = (24 \text{ V})(3 \text{ A}) = 72 \text{ W}$$

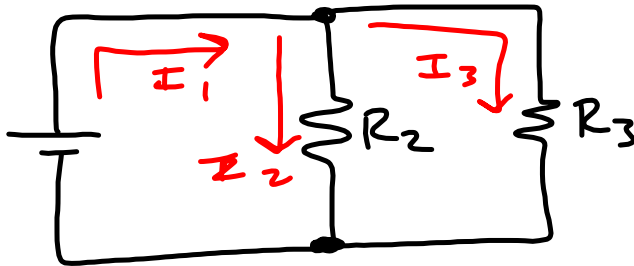
$$P_3 = \frac{(24 \text{ V})(3 \text{ A})}{72 \text{ W}}$$

$$\frac{1}{R_{\text{eq}}} = \frac{1}{R_2} + \frac{1}{R_3}$$

$$\frac{1}{R_{\text{eq}}} = \frac{1}{8 \Omega} + \frac{1}{8 \Omega}$$

$$R_{\text{eq}} = 4 \Omega$$

2)



$$V_{\text{total}} = 12\text{V}$$

$$R_{\text{eq}} = 2\Omega$$

$$I_1 = 6\text{A}$$

$$P_{\text{total}} = 72\text{W}$$

$$V_2 = 12\text{V}$$

$$R_2 = 6\Omega$$

$$I_2 = 2\text{A}$$

$$P_2 = 24\text{W}$$

$$V_3 = 12\text{V}$$

$$R_3 = 3\Omega$$

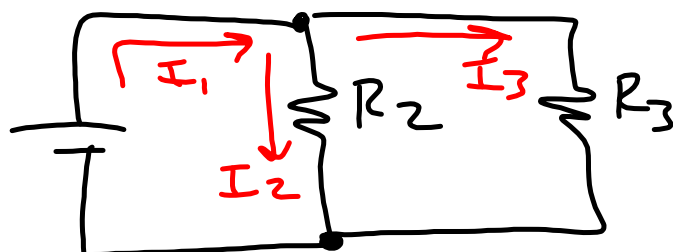
$$I_3 = 4\text{A}$$

$$P_3 = 48\text{W}$$

$$\frac{1}{R_{\text{eq}}} = \frac{1}{6\Omega} + \frac{1}{3\Omega}$$

$$R_{\text{eq}} = 2\Omega$$

3)



$$V_{\text{total}} = 6 \text{ V}$$

$$R_{\text{eq}} = 4 \Omega$$

$$I_1 = 1.5 \text{ A}$$

$$P_1 = 9 \text{ W}$$

$$V_2 = 6 \text{ V}$$

$$R_2 = 12 \Omega$$

$$I_2 = 0.5 \text{ A}$$

$$P_2 = 3 \text{ W}$$

$$V_3 = 6 \text{ V}$$

$$R_3 = 6 \Omega$$

$$I_3 = 1 \text{ A}$$

$$P_3 = 6 \text{ W}$$

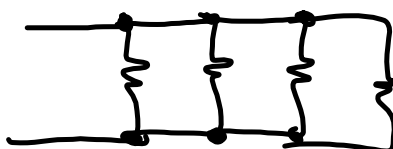
Holiday lights:

- All series

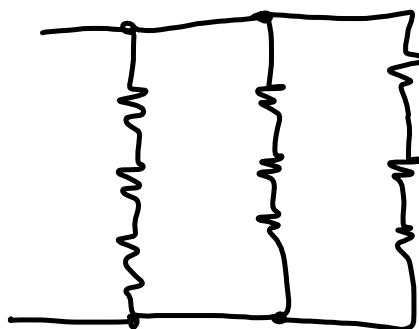


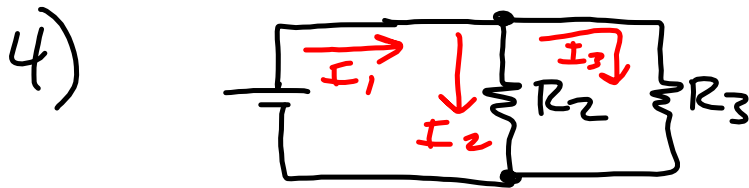
1 out, all out

- All parallel



- "New version"





$$V_{\text{total}} = 36 \text{ V}$$

$$R_{\text{eq}} = 3 \Omega$$

$$I_1 = 12 \text{ A}$$

$$P_{\text{total}} = 432 \text{ W}$$

$$V_2 = 36 \text{ V}$$

$$R_2 = 4 \Omega$$

$$I_2 = 9 \text{ A}$$

$$P_2 = 324 \text{ W}$$

$$V_3 = 36 \text{ V}$$

$$R_3 = 12 \Omega$$

$$I_3 = 3 \text{ A}$$

$$P_3 = 108 \text{ W}$$

$$\frac{1}{R_{\text{eq}}} = \frac{1}{4 \Omega} + \frac{1}{12 \Omega}$$

$$R_{\text{eq}} = 3 \Omega$$



$$V_{\text{total}} = 72\text{V}$$

$$R_{\text{eq}} = 6\Omega$$

$$I_1 = 12\text{A}$$

$$P_1 = 864\text{W}$$

$$V_2 = 72\text{V}$$

$$R_2 = 24\Omega$$

$$I_2 = 3\text{A}$$

$$P_2 = 216\text{W}$$

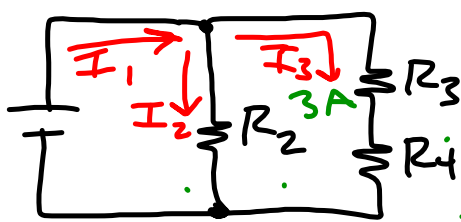
$$V_3 = 72\text{V}$$

$$R_3 = 8\Omega$$

$$I_3 = 9\text{A}$$

$$P_3 = 648\text{W}$$

6)



$$R_2 = 8\Omega \quad I_2 = \frac{24V}{8\Omega} = 3A$$

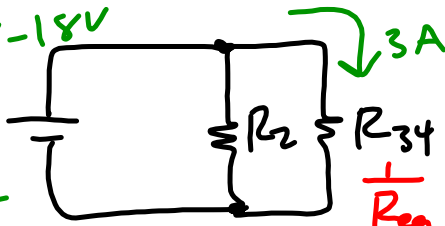
$$R_3 = ? \quad I_3 = 3A$$

$$R_4 = 6\Omega$$

$$V_{total} = 24V$$

$$V_4 = I_3 R_4 = (3A)(6\Omega) = 18V$$

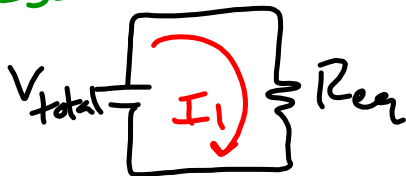
$$V_3 = 24V - 18V = 6V$$



$$R_3 = \frac{6V}{3A} = 2\Omega$$

$$\frac{1}{R_{eq}} = \frac{1}{R_2} + \frac{1}{R_{34}}$$

$$R_{34} = R_3 + R_4$$



$$V_{total} = V_{ab} = 24V$$

$$I_1 = 6A$$

$$V_{total} = I_1 R_{eq}$$

$$R_{eq} = \frac{V_{total}}{I_1} = \frac{24V}{6A} = 4\Omega$$

$$\frac{1}{R_{eq}} = \frac{1}{R_2} + \frac{1}{R_{34}}$$

$$R_{34} = \left[\frac{1}{R_{eq}} - \frac{1}{R_2} \right]^{-1}$$

$$= \left[\frac{1}{4\Omega} - \frac{1}{8\Omega} \right]^{-1}$$

$$= 8\Omega$$

$$R_{34} = R_3 + R_4$$

$$R_3 = R_{34} - R_4$$

$$= 8\Omega - 6\Omega$$

$$= 2\Omega$$