Circuit Challenge [Simulation]

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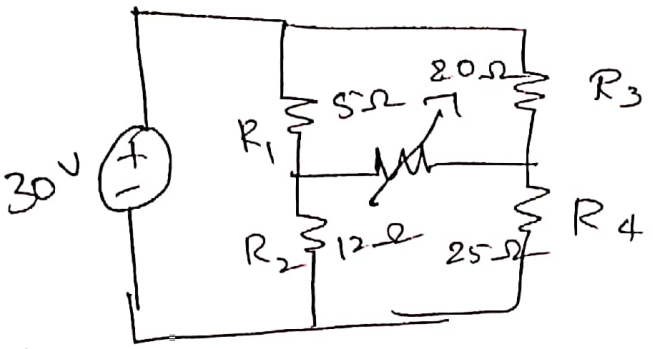
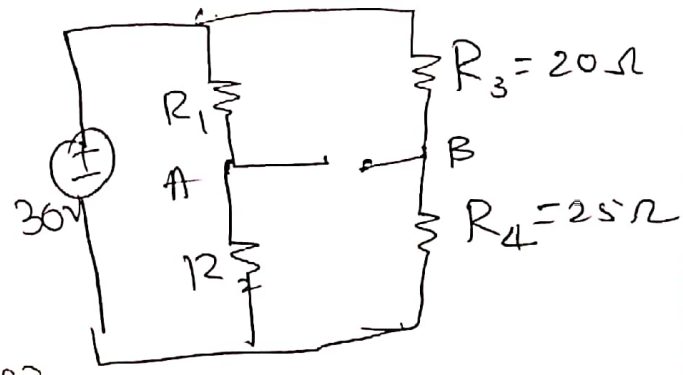
→ Max power transfer



Disconnect the load resistance from load terminals a & b to represent equivalent we have to determine V_{th} & R_{th}



$$V_A = V \times \frac{R_2}{(R_1+R_2)} = 30 \times \frac{12}{(5+12)}$$

$$V_A = 21.7\,V$$

$$V_B = V \times \frac{R_4}{R_3+R_4} = 30 \times \frac{25}{20+25}$$

$$V_B = 16.66\,V$$

$$V_{TH} = 4.15\,V$$

$$R_{TH} = R_{AB} = \left(\frac{R_1 R_2}{R_1+R_2}\right) + \left(\frac{R_3 R_4}{R_3+R_4}\right)$$

$$R_{th} = 14.64\,\Omega$$

$$P_{Max} = V_{TH}^2 / 4R_{th}$$

$$= 3.43\,mW$$