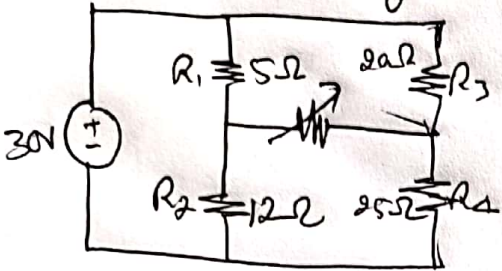


Circuit challenge [SIMULATION]

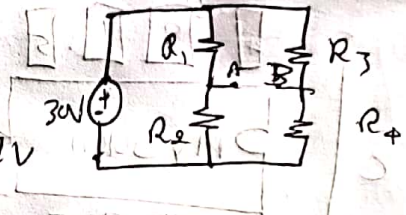
Max power Transfer:



Disconnect the load resistance from the load terminals a & b to represent the given circ as the Thevenin's equivalent. We have to determine V_{th} & R_{th} .

The voltage across the terminal AB in $V_{AB} = V_A - V_B$

$$V_A = V \times \frac{R_2}{R_1 + R_2} = 30 \times \frac{20}{5 + 12} = 21.7V$$

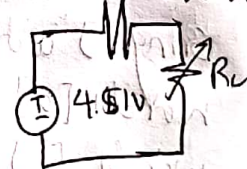


$$V_B = V \times \frac{R_4}{R_3 + R_4} = 30 \times \frac{25}{20 + 25} = 16.66V$$

$$V_{th} = V_{AB} = V_A - V_B = 4.51V$$

To calculate R_{th} : By replacing source with their internal resistance.

$$R_{th} = R_{AB} = \left[\frac{R_1 R_2}{R_1 + R_2} \right] + \left[\frac{R_3 R_4}{R_3 + R_4} \right] = 14.664 \Omega$$



where $R_L = R_{th}$

And the max: power transmitted to load R_L in

$$P_{max} = \frac{V_{th}^2}{4 R_{th}} = \frac{(4.51)^2}{4 \times 14.64} = 343.3mW$$

DC

P(RL) 347.3
mW

+ Add Expression

Export Results...

Run DC Solver

DC Sweep

Time Domain

Frequency Domain

