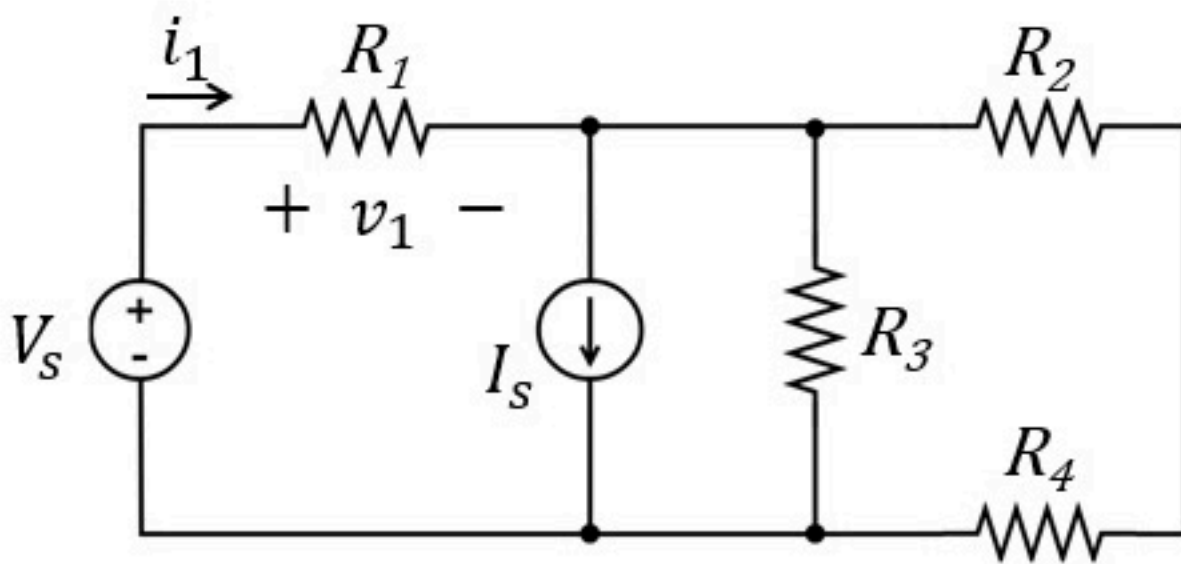


# Circuit theorems 009

Unlimited Attempts.

The resistance  $R_1$  is a variable resistor that can take on values in the range  $0 \leq R_1 \leq 24\Omega$ .

1. Find the value of  $R_1 = R_{1a}$  that maximizes current  $i_1$  and the resulting maximum current  $i_1 = i_{1a}$ .
2. Find the value of  $R_1 = R_{1b}$  that maximizes voltage  $v_1$  and the resulting maximum voltage  $v_1 = v_{1b}$ .
3. Find the value of  $R_1 = R_{1c}$  that maximizes the power received by  $R_1$  and the resulting maximum power  $P_{1c}$ .



Given Variables:

$V_s$  : 36 V

$I_s$  : 2 A

$R_2$  : 12 ohm

$R_3$  : 18 ohm

$R_4$  : 24 ohm

Calculate the following:

$i_{1a}$  (A) :

$R_{1a}$  (ohm) :

$v_{1b}$  (V) :

$R_{1b}$  (ohm) :

$P_{1c}$  (W) :

$R_{1c}$  (ohm) :

Hint: Replace the circuit (without  $R_1$ ) by its Thevenin model.