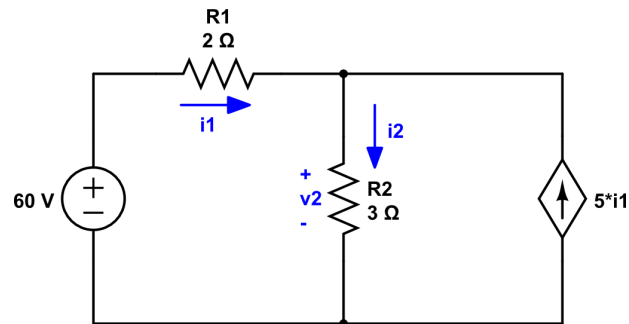


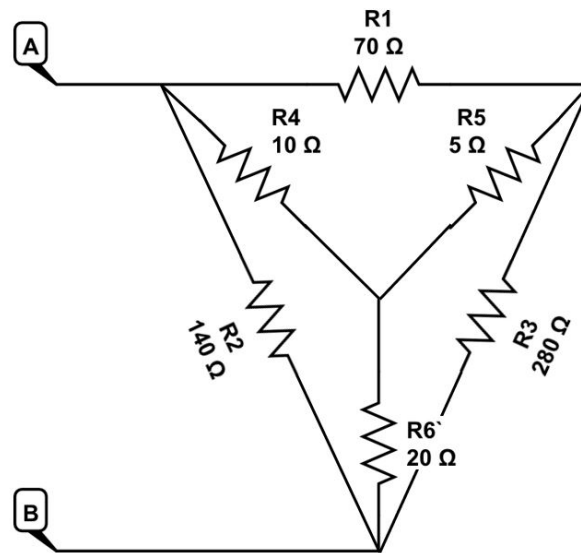
**Question 1** [10]

What is the value of  $v_2$ ?



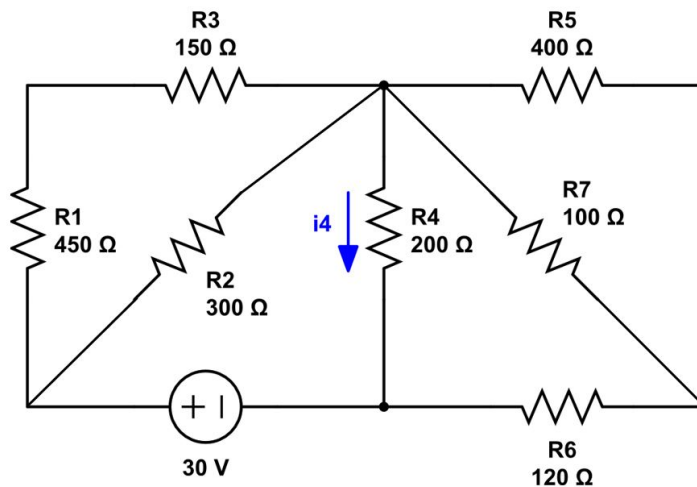
**Question 2** [10]

What is the equivalent resistance between  $A$  and  $B$ ?



### Question 3 [20]

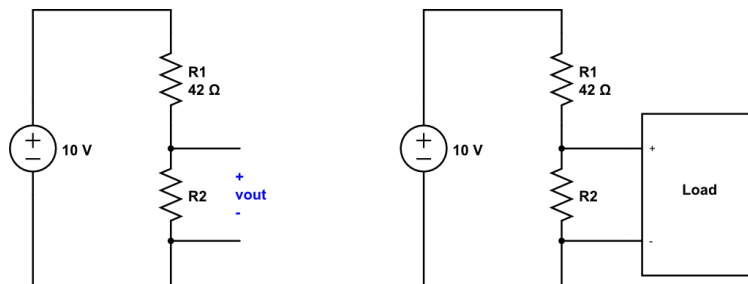
For the below circuit:



- (a) What is the equivalent resistance seen by the voltage source (30V)?
- (b) What is the current  $i_4$ ?

### Question 4 [20]

Consider the voltage divider below (both with and without a load):

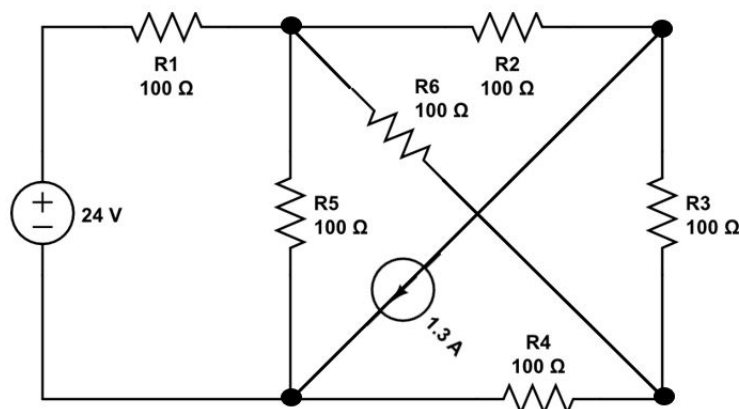


- (a) Without a load, what value of  $R_2$  will provide a  $v_{out}$  of 3V?
- (b) If the load has a resistance of 9Ω:
  - (i) For the  $R_2$  above, how does  $R_1$  need to change to maintain providing 3V to the load?
  - (ii) How much Power is being absorbed by the load?
  - (iii) How much Power is being provided by the 10V source?

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**Question 5** [40]

For the following circuit:



- (a) How many essential nodes ( $n_e$ )?
- (b) How many essential branches ( $b_e$ )?
- (c) List the essential branches.
- (d) Using the Node-Current Method, how many KCL equations are needed?
- (e) How many KVL equations are needed?
- (f) Write out the Node-Current Matrix (DO NOT SOLVE IT).

**Extra Credit**

What was the Max Salazar building named after?