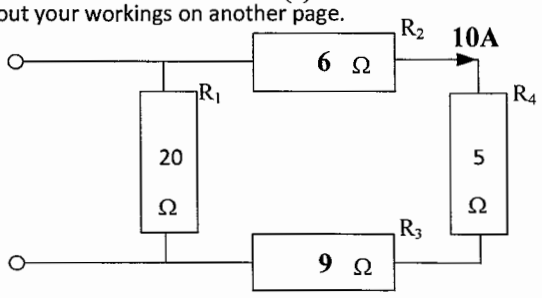
Ohms Law.
Work Sheet 16C
Harder Series-Parallel calculations.

Determine the unknown value(s).
Layout your workings on another page.

1.

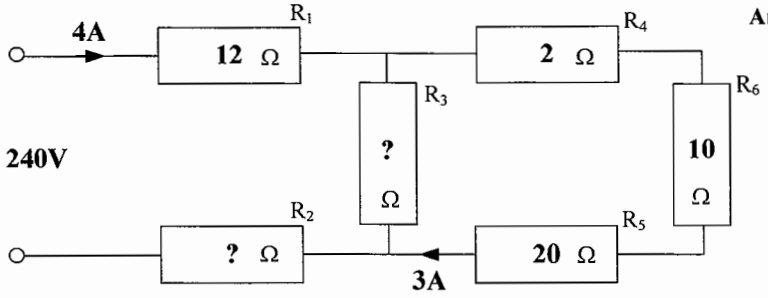


Answers:

V_s = Volts

I_{R1} = Amps

2.



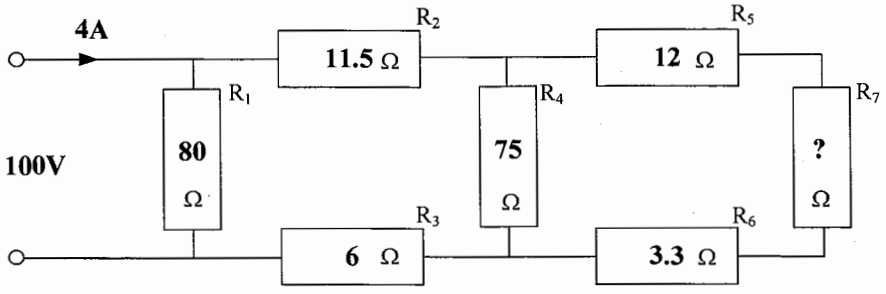
Answers:

I_{R3} = Amps

R_3 = Ohms

R_2 = Ohms

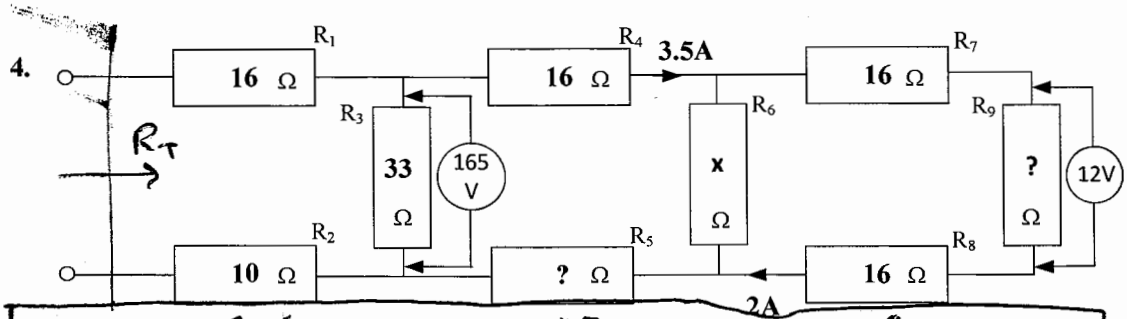
3.



R_7 =

Ohms

4.



Find: V_S = 386 **Volts,** R_T = 45.41 **Ohms,** R_9 = 6 **Ohms.**

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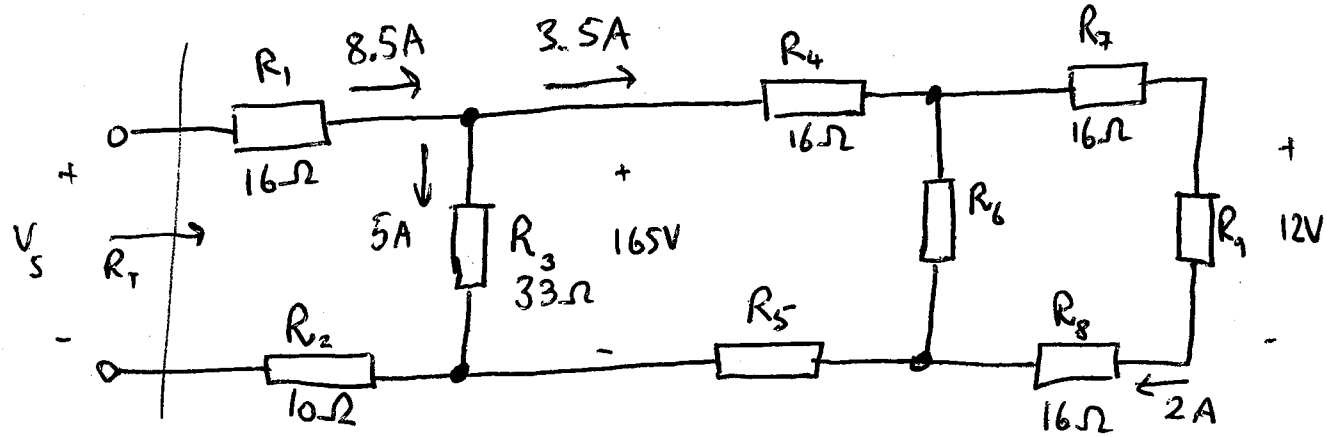
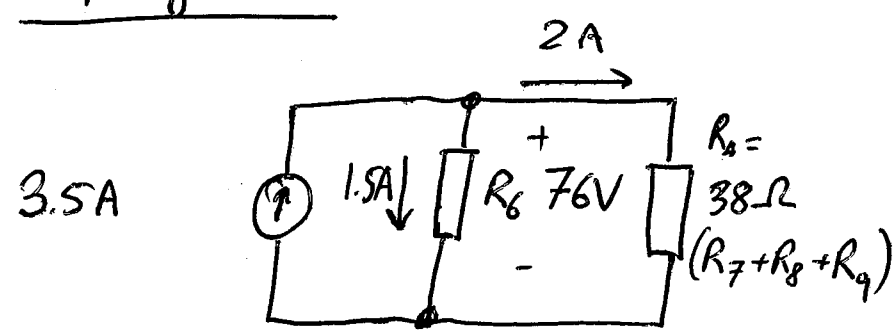


Find V_s, R_T, and all unknown resistances.

R_3 must have 5A of current flow, since it is 33V and has 165V drop.

R_9 must be 6Ω, since it has 2A current and 12V drop. $\therefore$ $\boxed{R_9 = 6\Omega}$

Computing R_6



$I_{R6} = 1.5A$ by KCL

R_A has 76 V drop

$\Rightarrow$ $\boxed{R_6 = \frac{76}{1.5} = 50.67\ \Omega}$

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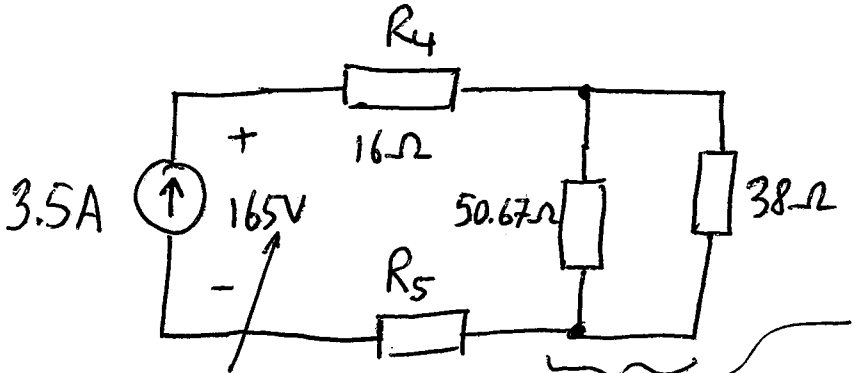
Computing R_5



$$R_{TOT} = \frac{165}{3.5} = 47.14\,\Omega$$

Total known resistances are:

$$21.71 + 16 = 37.71\,\Omega$$

$$\Rightarrow \boxed{R_5 = 47.14 - 37.71 = 9.43\,\Omega}$$

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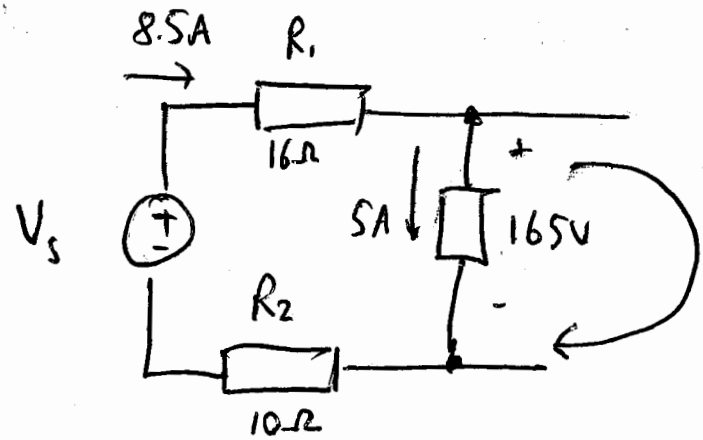
Computing V_s:

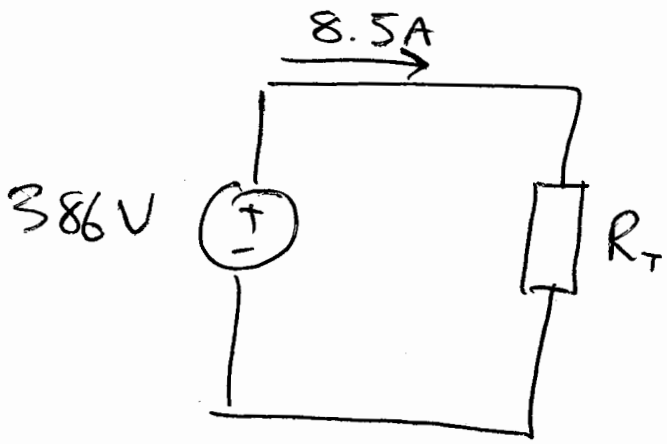


Actual connections are irrelevant as we know volt drop and current split.

$$V_s = 8.5 \cdot 16 + 165 + 8.5 \cdot 10$$

$$\boxed{V_s = 386\,V}$$

Computing R_T



$$\boxed{R_T = \frac{386}{8.5} = 45.41\,\Omega}$$