

Example

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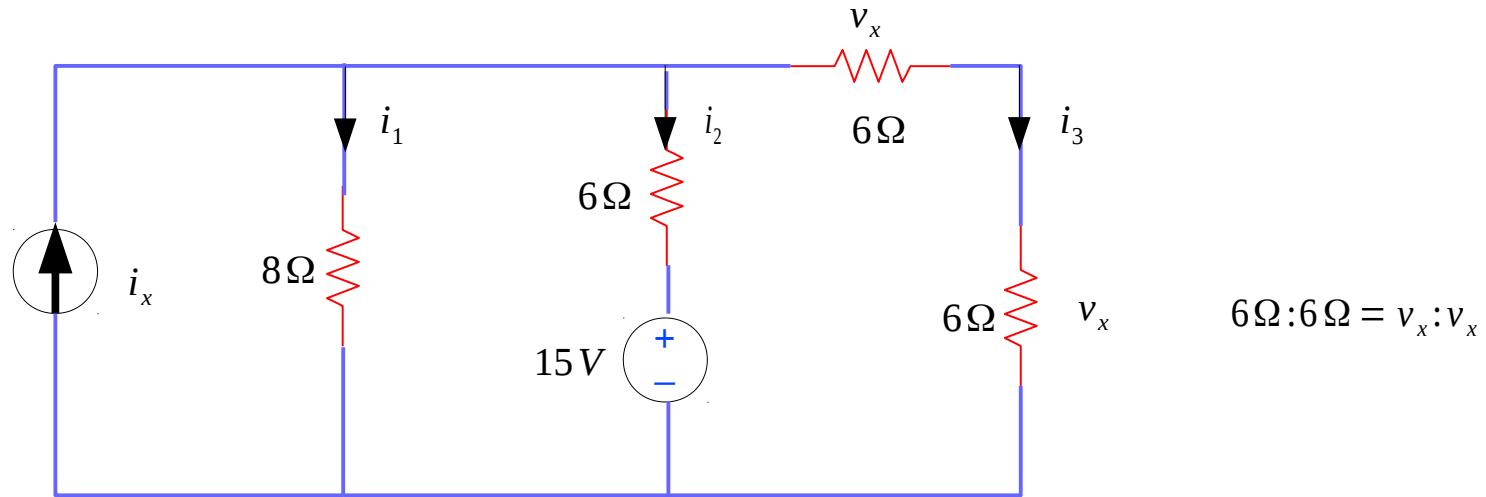
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Node Analysis

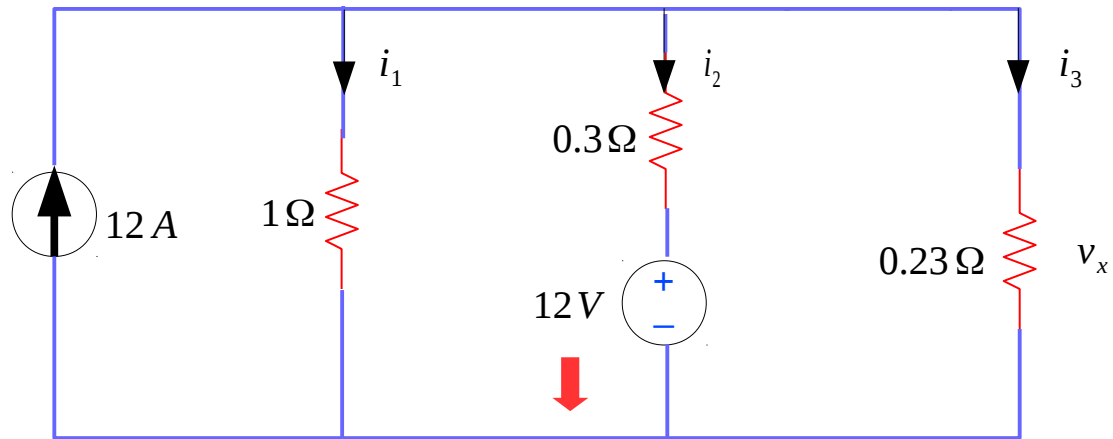


$$i_1 = \frac{2v_x}{8} \quad i_2 = \frac{2v_x - 15}{6} \quad i_3 = \frac{2v_x}{12}$$

$$i_x = \frac{v_x}{3} = \frac{v_x}{4} + \frac{v_x}{3} - \frac{5}{2} + \frac{v_x}{6} \quad \frac{5v_x}{12} = \frac{5}{2} \quad 2v_x = 12$$

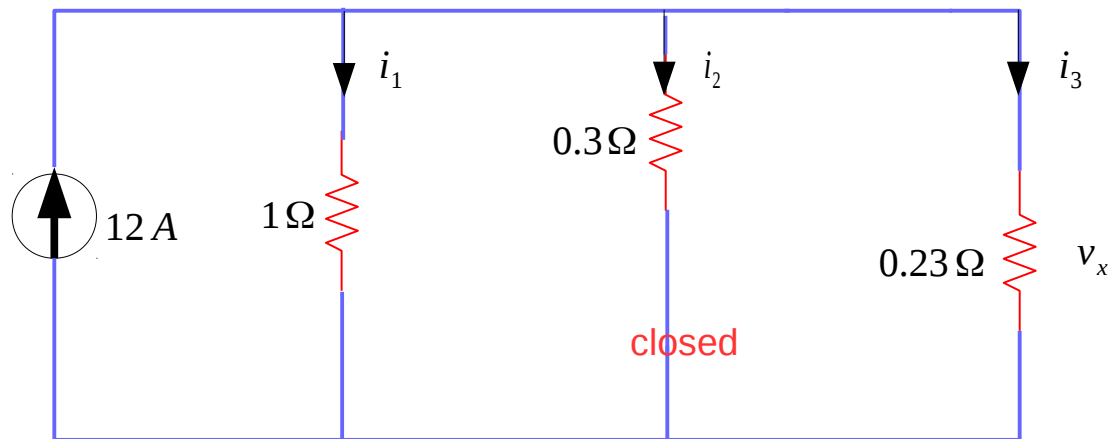
G. Rizzoni, "Principles and applications of electrical engineering"

Superposition



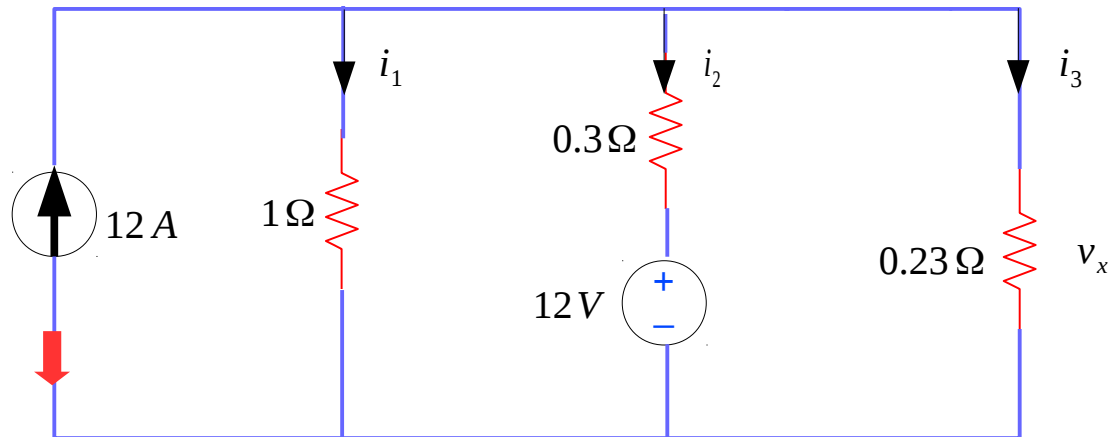
non-existent voltage source

0V but current should flow $I \neq 0$ closed



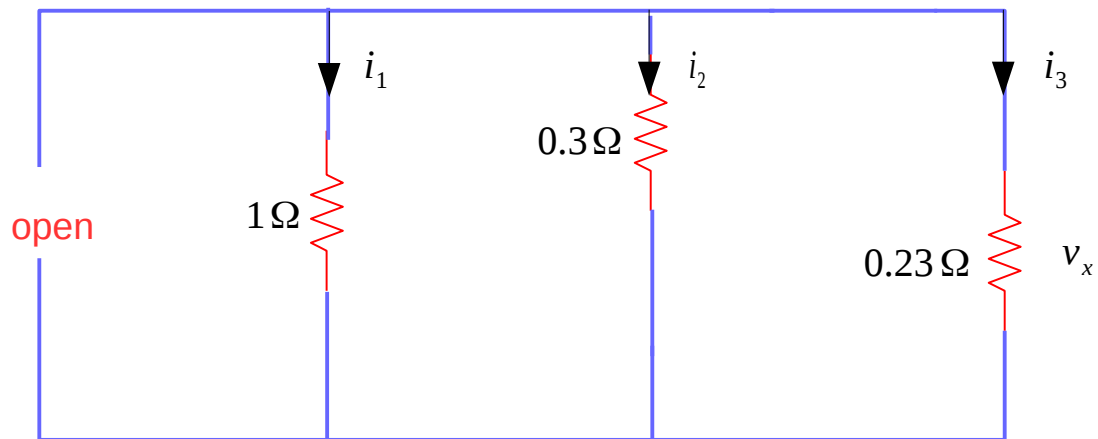
G. Rizzoni, "Principles and applications of electrical engineering"

Superposition



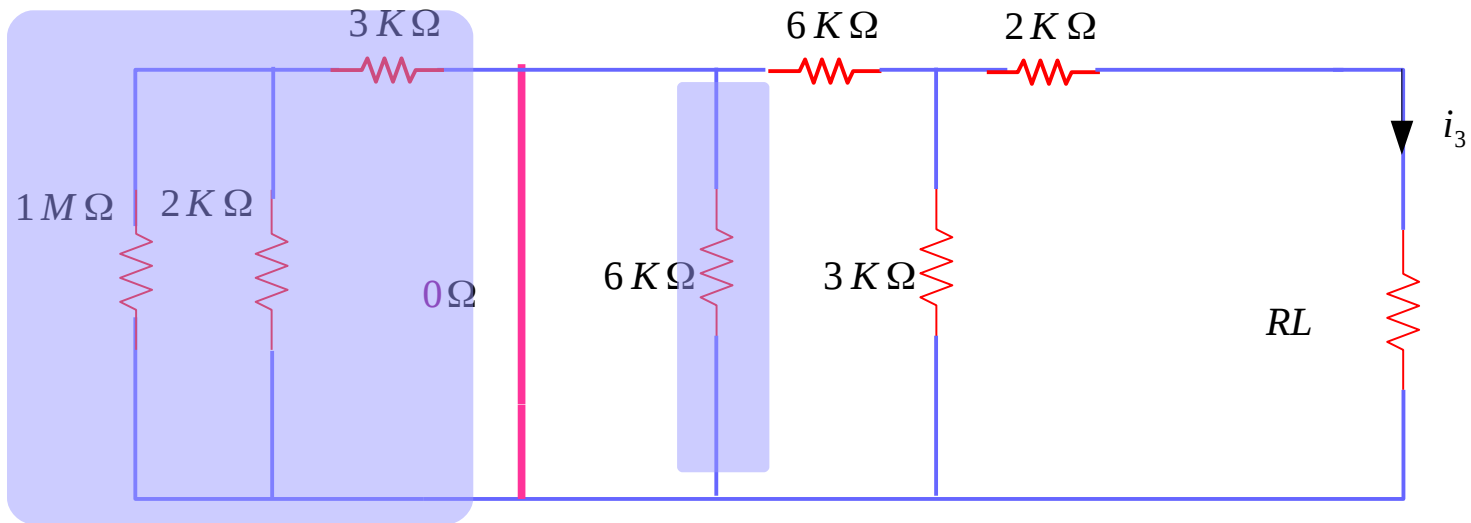
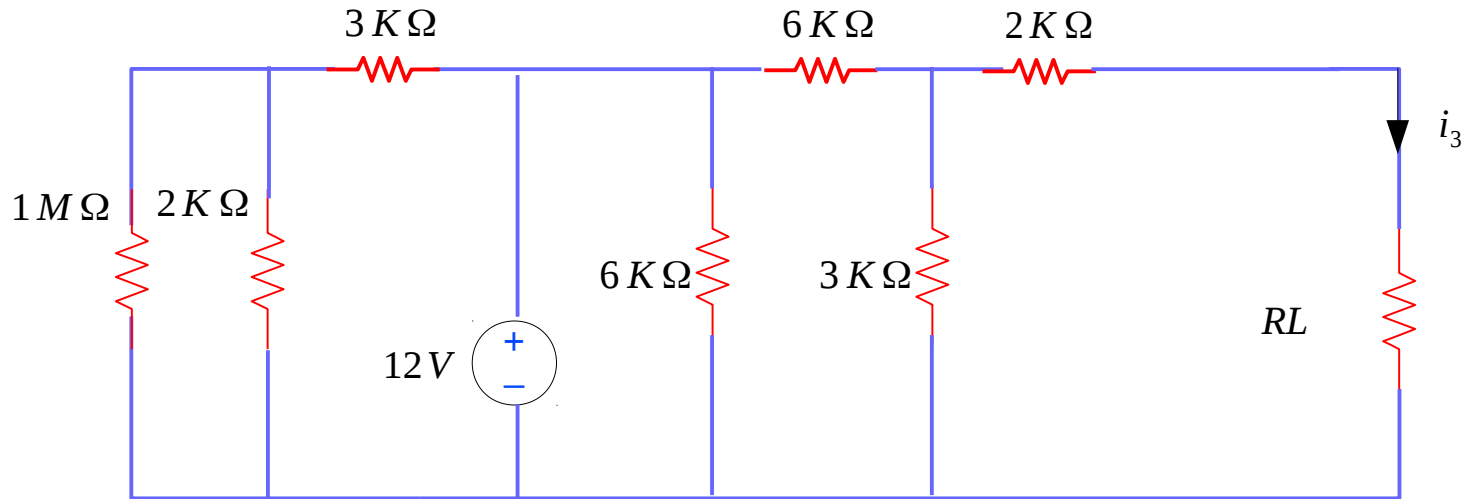
0 A but voltage should be maintained $V \neq 0$ open

non-existent current source



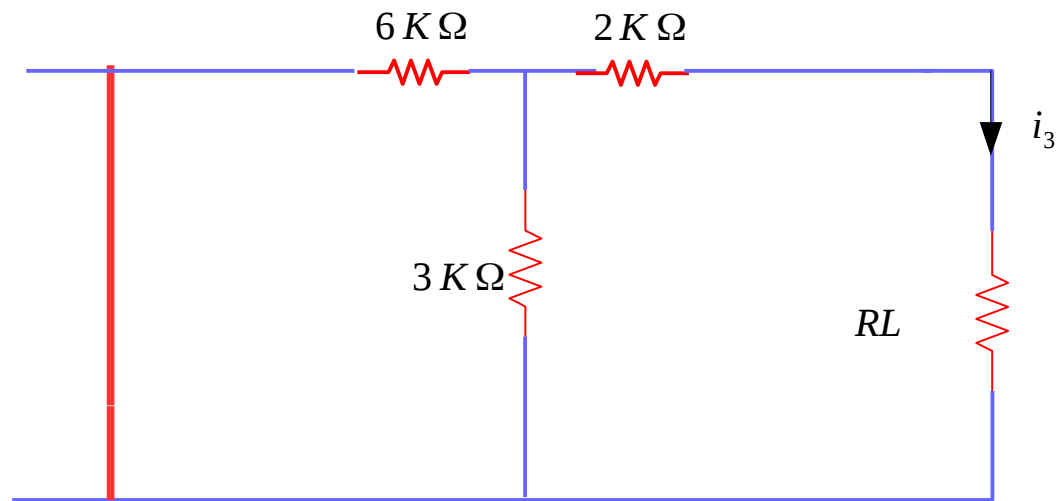
G. Rizzoni, "Principles and applications of electrical engineering"

Equivalent R



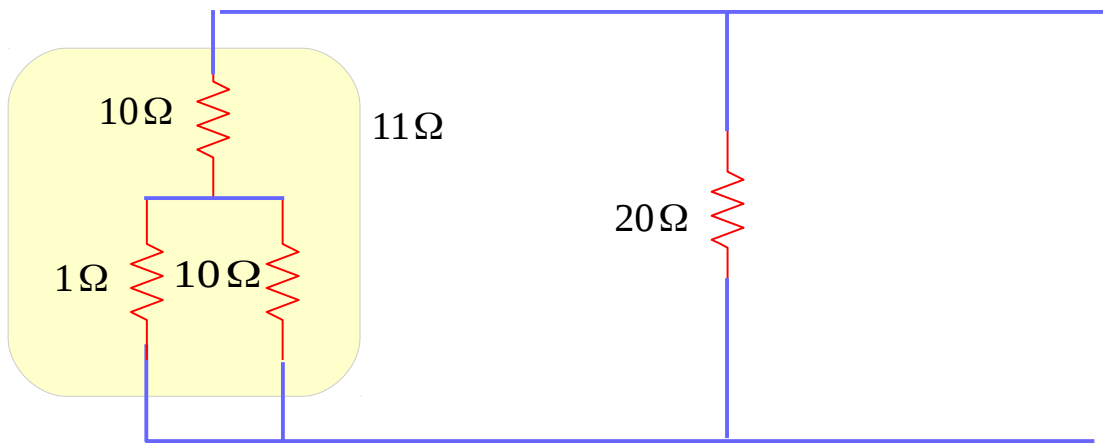
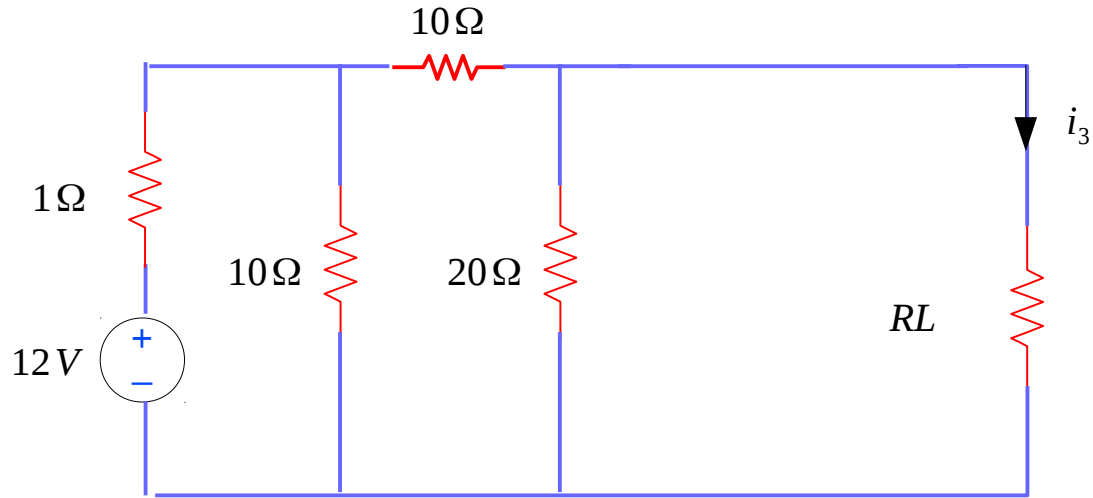
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Equivalent R



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Equivalent R



G. Rizzoni, "Principles and applications of electrical engineering"

References

- [1] <http://en.wikipedia.org/>
- [2] www.allaboutcircuits.com
- [3]