

Block A: Unit 2

Q1. [Problem 3.7]

Using node voltage analysis in the circuit of Figure P3.7, find the currents i_1 and i_2 .

$R_1 = 3\Omega$, $R_2 = 1\Omega$, $R_3 = 6\Omega$.

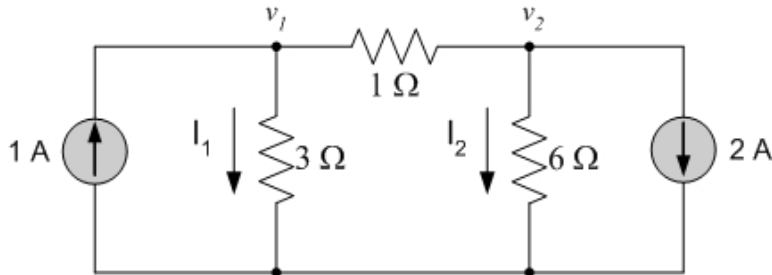


Figure P3.7

Q2. [Problem 3.3]

Using node voltage analysis in the circuit of Figure P3.3, find the voltage v across the 0.25Ω resistor.

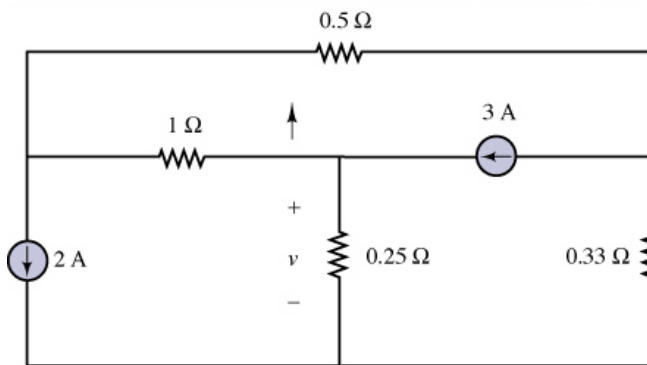


Figure P3.3

Q3. [Problem 3.10]

Using node voltage analysis in the circuit of Figure P3.10, find the three indicated node voltages.

Let $I = 0.2A$, $R_1 = 200\Omega$, $R_2 = 75\Omega$, $R_3 = 25\Omega$, $R_4 = 50\Omega$, $R_5 = 100\Omega$, $V = 10V$.

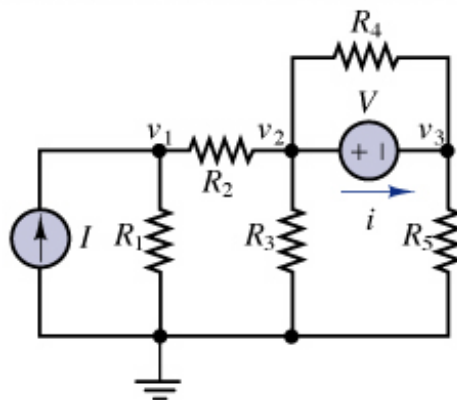


Figure P3.10

Q4. [Problem 3.12]

Find the power delivered to the load resistor R_L in Figure P3.12 using nodal voltage analysis

$$R_1 = 2\Omega, R_V = R_2 = R_L = 4\Omega, V_S = 4V, I_S = 0.5A$$

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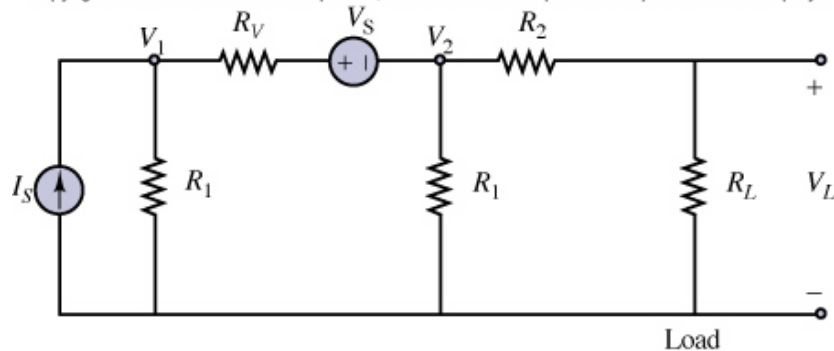


Figure P3.12

Q5 [Problem 3.14]

Using mesh current analysis, find the currents i_1 and i_2 for the circuit of Figure P3.14.

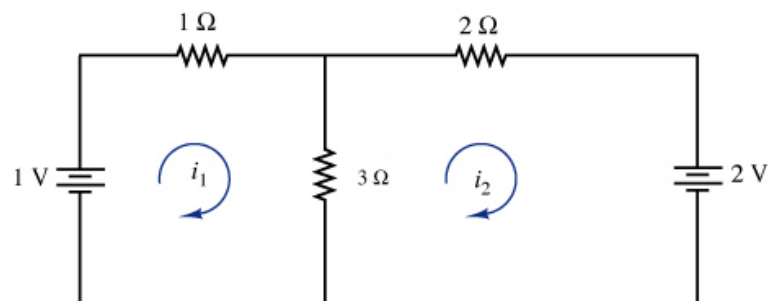


Figure P3.14

Q6. [Problem 3.16]

Find the voltage v across the 3Ω resistor in Figure P3.16 using mesh current analysis

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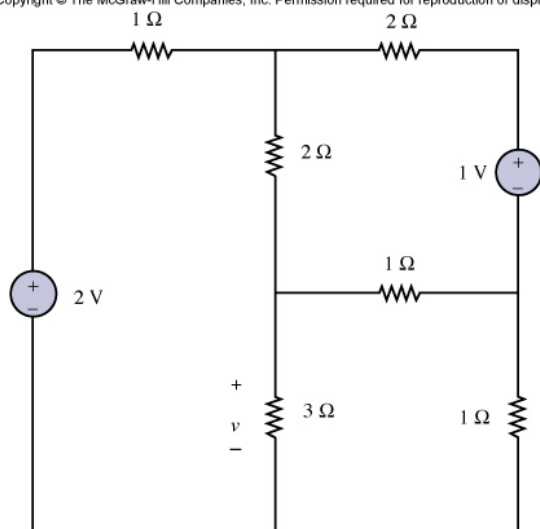


Figure P3.16

Q7. [Problem 3.18]

Using mesh current analysis, find the voltage v across the source in the circuit of Figure P3.18.

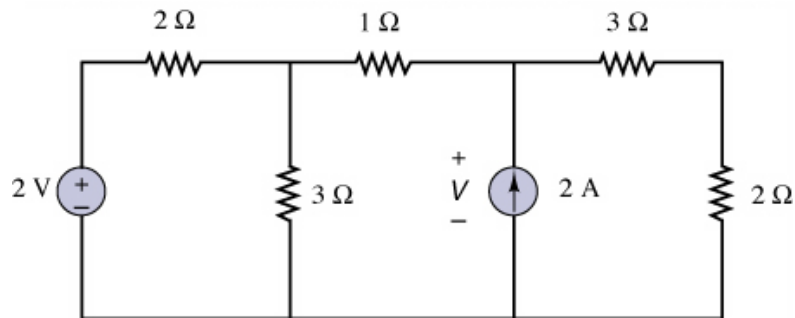


Figure P3.18

Q8. [Problem 3.43]

Determine the component of the current through R_3 in Figure P3.43 due to V_{S2} alone.

$$V_{S1} = V_{S2} = 450\text{V}, R_1 = 7\Omega, R_2 = 5\Omega, R_3 = 10\Omega, R_4 = R_5 = 1\Omega$$

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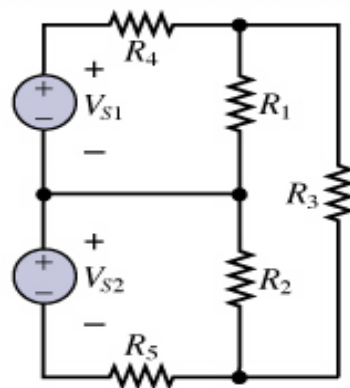


Figure P3.43

Q9. [Problem 3.42]

Using superposition, determine the voltage across R_2 in the circuit of Figure P3.42. Is this the best approach for this example? $V_{S1} = V_{S2} = 12\text{V}$; $R_1 = R_2 = R_3 = 1\text{k}\Omega$

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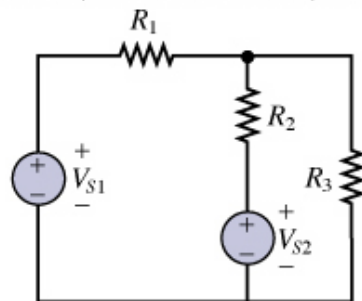


Figure P3.42

Q10. [Problem 3.46]

Repeat Q3 [Problem 3.10], but this time using the principle of superposition

Numerical solutions**Q1. [Problem 3.7]** $-0.5\text{A}, -0.5\text{A}$ **Q2. [Problem 3.3]** 0.34V **Q3. [Problem 3.10]** $14.24\text{V}, 4.58\text{V}, -5.42\text{V}$ **Q4. [Problem 3.12]** 25 mW **Q5. [Problem 3.14]** $-0.091\text{A}, -0.455\text{A}$ **Q6. [Problem 3.16]** 0.5821 V **Q7. [Problem 3.18]** 3.89V **Q8. [Problem 3.43]** 32.03A **Q9. [Problem 3.42]** 4V