

Electrical Circuit (1)

Circuit Technique (week6 class1)

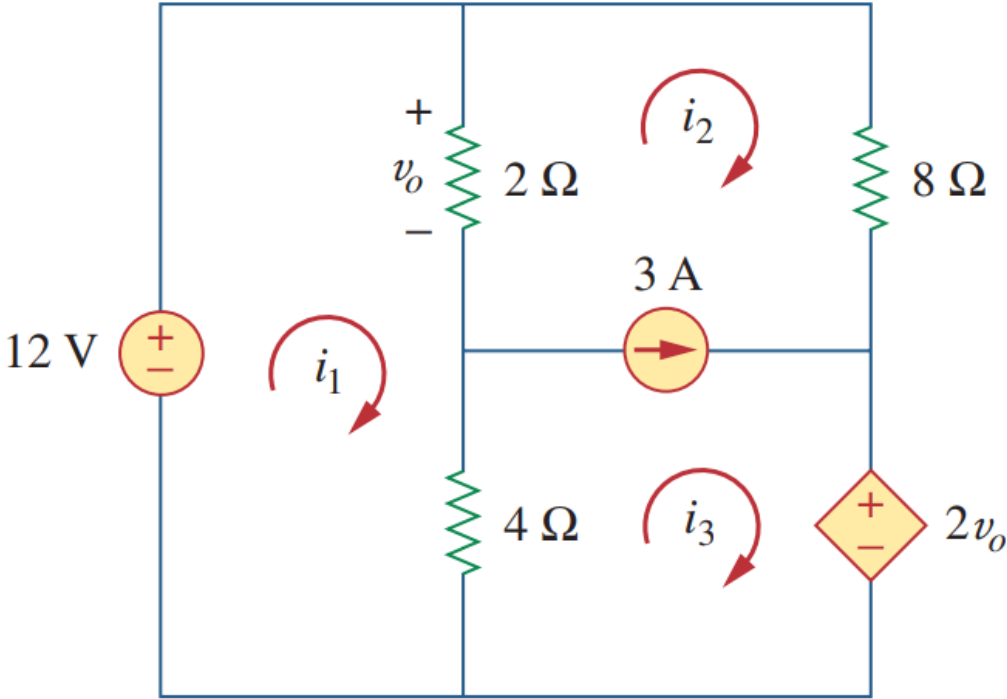
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Mesh Analysis with Current Sources



Mesh Analysis with Current Sources

Basic equation

$$-12 + 2(i_1 - i_2) + 4(i_1 - i_3) = 0$$

$$i_3 - i_2 = 3$$

$$4(i_3 - i_1) + 2(i_2 - i_1) + 8i_2 + 4(i_1 - i_2) = 0$$

Formulated equation

$$6i_1 - 2i_2 - 4i_3 = 12$$

$$-i_2 + i_3 = 3$$

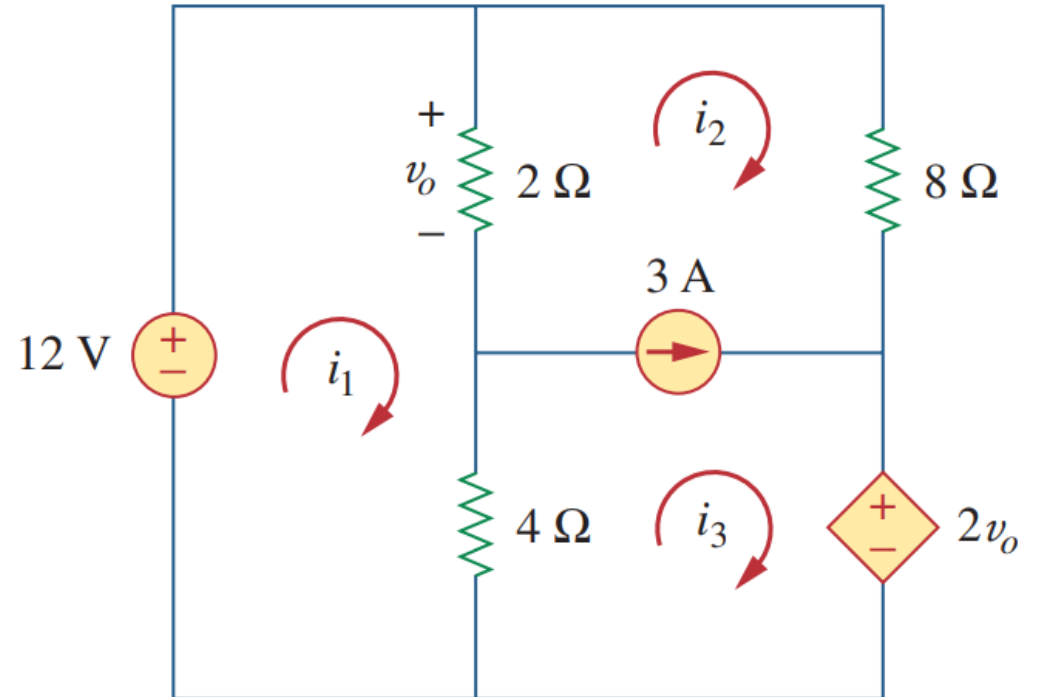
$$-2i_1 + 6i_2 + 4i_3 = 0$$

Final answer

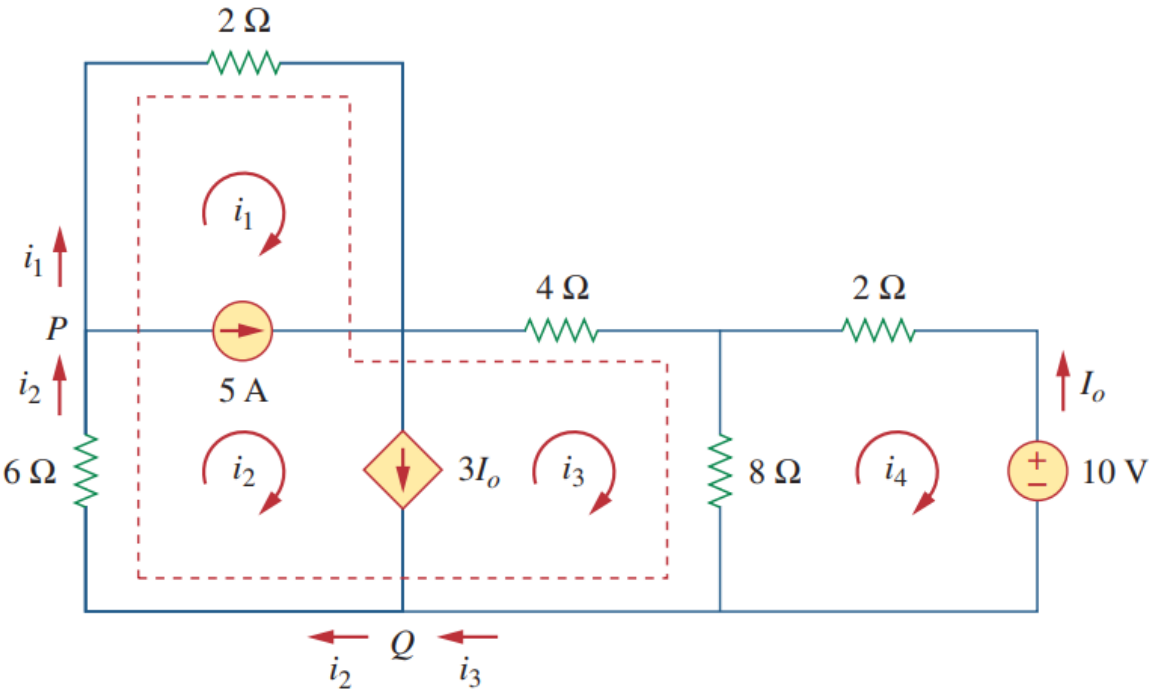
$$i_1 = 3.5 \text{ A}$$

$$i_2 = -0.5 \text{ A}$$

$$i_3 = 2.5 \text{ A}$$



Mesh Analysis with Current Sources



Mesh Analysis with Current Sources

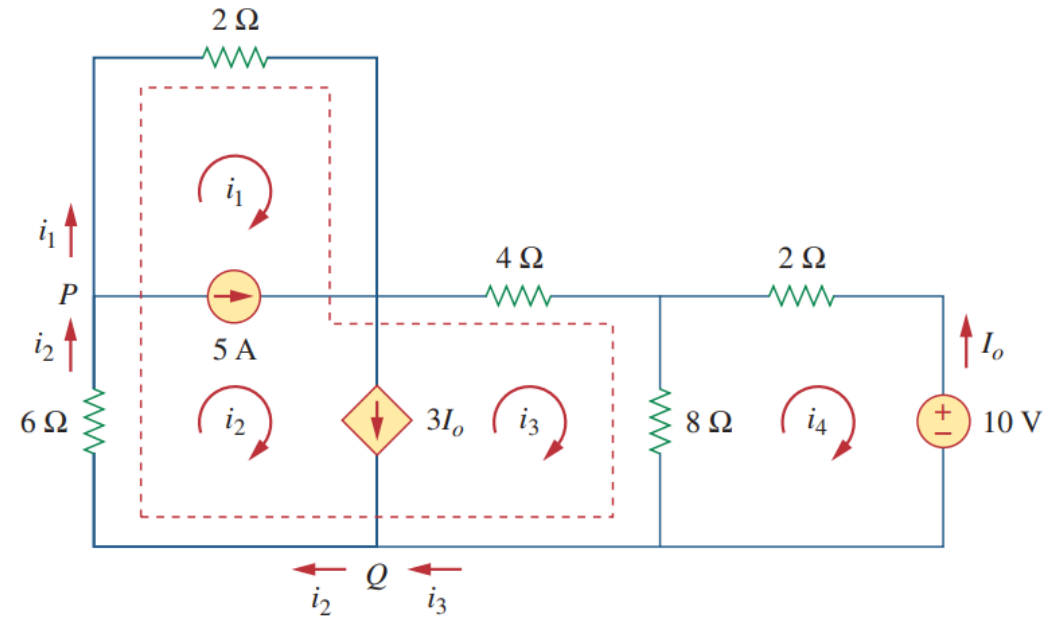
Basic equation

$$i_2 - i_1 = 5$$

$$i_2 - i_3 = 3i_0 \quad i_0 = -i_4$$

$$6i_2 + 2i_1 + 4i_3 + 8(i_3 - i_4) = 0$$

$$8(i_4 - i_3) + 2i_4 + 10 = 0$$



Formulated equation

$$-i_1 + i_2 = 5$$

$$i_2 - i_3 + 3i_4 = 0$$

$$2i_1 + 6i_2 + 12i_3 - 8i_4 = 0$$

$$-8i_3 + 10i_4 = -10$$

a	b	c	d	e
-1	1	0	0	5
0	1	-1	3	0
2	6	12	-8	0
0	0	-8	10	-10

Final answer

$$i_1 = -7.5 \text{ A}$$

$$i_2 = -2.5 \text{ A}$$

$$i_3 = 3.9286 \text{ A}$$

$$i_4 = 2.1429 \text{ A}$$

