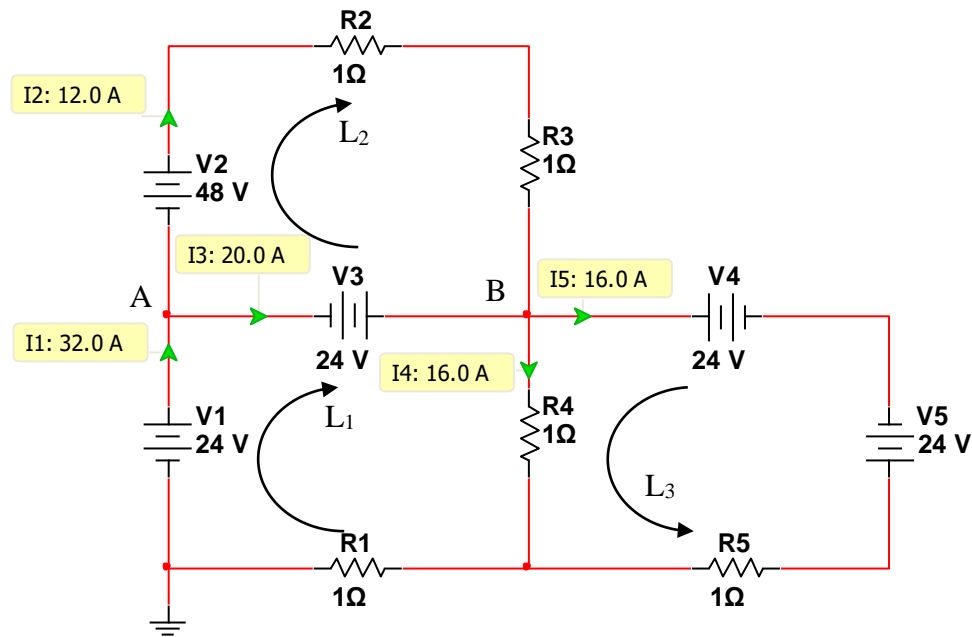


Kirchhoff-Uygulama-1



$$V1 := 24 \quad V2 := 48 \quad V3 := 24 \quad V4 := 24 \quad V5 := 24$$

$$R1 := 1 \quad R2 := 1 \quad R3 := 1 \quad R4 := 1 \quad R5 := 1$$

$$A: I1 - I2 - I3 = 0$$

$$B: I2 + I3 - I4 - I5 = 0$$

$$L1: I4 \cdot R4 + I1 \cdot R1 = V1 + V3$$

$$L2: I2 \cdot R2 + I2 \cdot R3 = V2 - V3$$

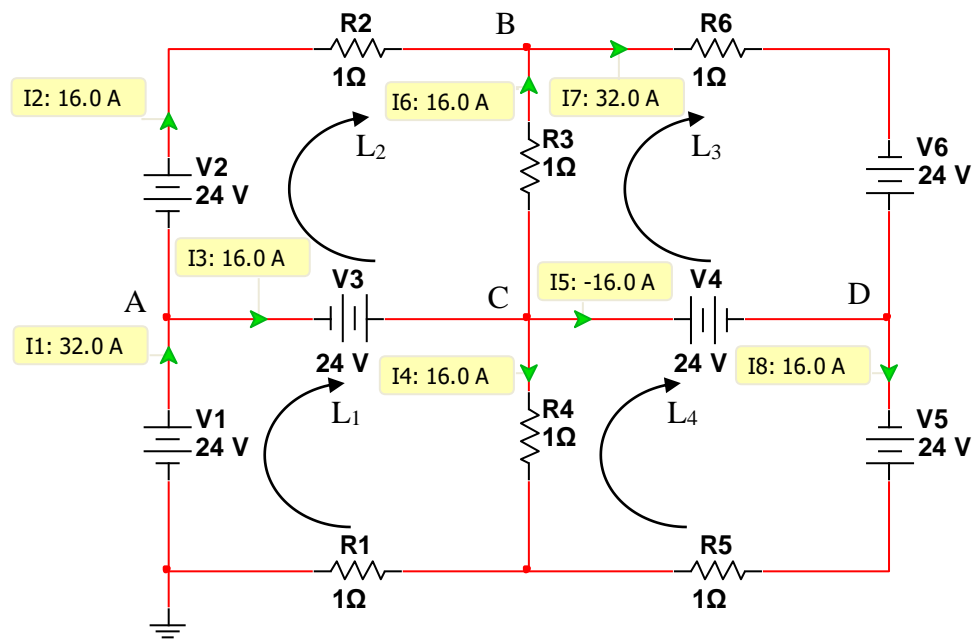
$$L3: I4 \cdot R4 - I5 \cdot R5 = V4 - V5$$

$$IMAT := \begin{pmatrix} 1 & -1 & -1 & 0 & 0 \\ 0 & 1 & 1 & -1 & -1 \\ R1 & 0 & 0 & R4 & 0 \\ 0 & R2 + R3 & 0 & 0 & 0 \\ 0 & 0 & 0 & R4 & -R5 \end{pmatrix}$$

$$VMAT := \begin{pmatrix} 0 \\ 0 \\ V1 + V3 \\ V2 - V3 \\ V4 - V5 \end{pmatrix}$$

$$I := IMAT^{-1} \cdot VMAT \quad I = \begin{pmatrix} 32 \\ 12 \\ 20 \\ 16 \\ 16 \end{pmatrix}$$

Kirchhoff-Uygulama-2



$$V1 := 24 \quad V2 := 24 \quad V3 := 24 \quad V4 := 24 \quad V5 := 24 \quad V6 := 24$$

$$R1 := 1 \quad R2 := 1 \quad R3 := 1 \quad R4 := 1 \quad R5 := 1 \quad R6 := 1$$

$$A: I1 - I2 - I3 = 0$$

$$B: I2 + I6 - I7 = 0$$

$$C: I3 - I4 - I5 - I6 = 0$$

$$D: I5 + I7 - I8 = 0$$

$$L1: I4 \cdot R4 + I1 \cdot R1 = V1 + V3$$

$$L2: I2 \cdot R2 - I6 \cdot R3 = V2 - V3$$

$$L3: I6 \cdot R3 + I7 \cdot R6 = V4 + V6$$

$$L4: -I4 \cdot R4 + I8 \cdot R5 = -V4 + V5$$

$$IMAT := \begin{pmatrix} 1 & -1 & -1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & -1 & 0 \\ 0 & 0 & 1 & -1 & -1 & -1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 1 & -1 \\ R1 & 0 & 0 & R4 & 0 & 0 & 0 & 0 \\ 0 & R2 & 0 & 0 & 0 & -R3 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & R3 & R6 & 0 \\ 0 & 0 & 0 & -R4 & 0 & 0 & 0 & R5 \end{pmatrix}$$

$$VMAT := \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ V1 + V3 \\ V2 - V3 \\ V4 + V6 \\ -V4 + V5 \end{pmatrix}$$

$$I := IMAT^{-1} \cdot VMAT$$

$$I = \begin{pmatrix} 32 \\ 16 \\ 16 \\ 16 \\ -16 \\ 16 \\ 32 \\ 16 \end{pmatrix}$$