$V_z = ?$

$V = IR$

$V_z = (i_2 - i_3) 4$

Göz 1 => $6i_1 - 12 + V_1 = 0$

Göz 2 => $9i_2 + 4(i_2 - i_3) - V_1 = 0$

$$6i_1 - 12 + 9i_2 + 4i_2 - 4i_3 = 0$$

$$6i_1 + 13i_2 - 4i_3 = 12 \quad \cdots \quad ①$$

Göz 3 => $2V_z + 4(i_3 - i_2) + 3i_3 = 0$

$$2(4(i_2 - i_3) + 4i_3 - 4i_2 + 3i_3 = 0$$

$$8i_2 - 8i_3 + 4i_3 - 4i_2 + 3i_3 = 0$$

$$4i_2 = i_3 \quad \cdots \quad ②$$

$I_a = -i_3 \quad \cdots \quad ③$

$5I_a = i_1 - i_2$

$-5i_3 = i_1 - i_2$

$i_1 - i_2 + 5i_3 = 0 \quad \cdots \quad ③$

$$\left.\begin{array}{l} 6i_1 + 13i_2 - 4i_3 = 12 \\ 4i_2 - i_3 = 0 \Rightarrow i_3 = 4i_2 \\ i_1 - i_2 + 5i_3 = 0 \end{array}\right\} \longrightarrow$$

$6i_1 + 13i_2 - 4(4i_2) = 12$

$i_1 - i_2 + 20i_2 = 0$

$6i_1 - 3i_2 = 12$

$i_1 = -19i_2$

$6(-19i_2) - 3i_2 = 12$

$i_2 = -0,102 A$

$V_z = 6,472 V$

$$4V_x$$
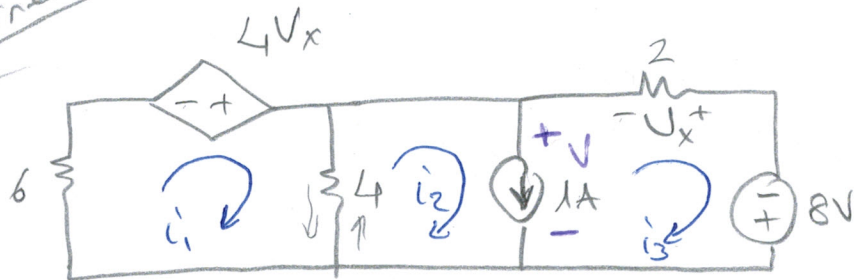
$$V_x = ?$$

$$\text{Göz } 1 \Rightarrow \quad 6i_1 - 4V_x + 4(i_1 - i_2) = 0$$

$$10i_1 - 4i_2 = 4V_x \quad \cdots \textcircled{1}$$

$$V = I R$$

$$V_x = -i_3 \cdot 2$$
③

$$1 = i_2 - i_3$$
④

$$\text{Göz } 2 \Rightarrow \quad 4(i_2 - i_1) + V = 0$$

$$\text{Göz } 3 \Rightarrow \quad -V + 2i_3 - 8 = 0$$

$$4i_2 - 4i_1 + 2i_3 = 8 \quad \cdots \textcircled{2}$$

$$\textcircled{1} \text{ ve } \textcircled{3} \text{ 'den} \quad \Rightarrow \quad 10i_1 - 4i_2 = 4(-2i_3)$$

$$\begin{cases} -10i_1 - 4i_2 + 8i_3 = 0 \quad \leftarrow \\ -4i_1 + 4i_2 + 2i_3 = 8 \quad \Leftarrow \\ i_2 - i_3 = 1 \rightarrow i_2 = 1 + i_3 \end{cases}$$

$$10i_1 - 4 - 4i_3 + 8i_3 = 0$$

$$10i_1 + 4i_3 = 4$$

$$-4i_1 + 4 + 4i_3 + 2i_3 = 8$$

$$-4i_1 + 6i_3 = 4$$

$$6 / \quad 10i_1 + 4i_3 = 4$$
$$-4 / \quad -4i_1 + 6i_3 = 4$$

$$60i_1 + 24i_3 = 24$$
$$16i_1 - 24i_3 = -16$$

$$76i_1 = 8$$
$$i_1 = 0,105 \, A$$

$$i_3 = 0,736 \, A$$
$$i_2 = 1,736 \, A$$

$$V_x = -2 \cdot (0,736)$$
$$= -1,472 \, V$$

Örnek
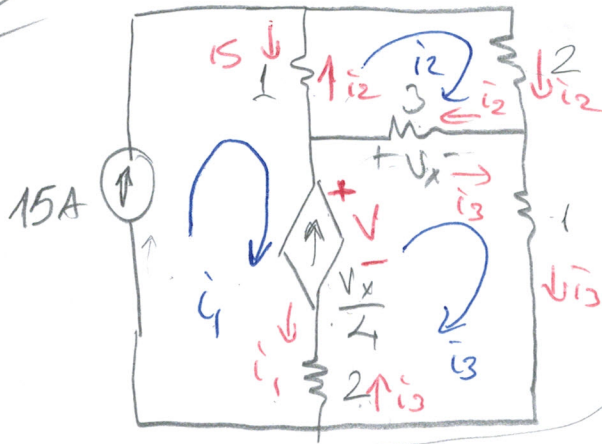
Göz analizi ile $V_x = ?$

Göz 1 $\Rightarrow i_1 = 15A$ ⦿

Göz 2 $\Rightarrow 1(i_2 - i_1) + 2i_2 + 3(i_2 - i_3) =$

Göz 3 $\Rightarrow 3(i_3 - i_2) + 1i_3 + 2(i_3 - i_1) - V = 0$

$$\frac{V_x}{4} = i_3 - i_1 \quad ⦿$$

$U = IR$

$V_x = (i_3 - i_2) \cdot 3 \quad ⦿$

$i_2 - i_1 + 2i_2 + 3i_2 - 3i_3 = 0$

$-i_1 + 6i_2 - 3i_3 = 0$

$6i_2 - 3i_3 = 15$

$\boxed{2i_2 - i_3 = 5}$

$U_x = 4i_3 - 4i_1$

$V_x = 3i_3 - 3i_2$

$3i_3 - 3i_2 = 4i_3 - 60$

$\boxed{i_3 + 3i_2 = 60}$

$2i_2 - \cancel{i_3} = 5$
$\cancel{i_3} + 3i_2 = 60$
_____
$5i_2 = 65$

$i_2 = 13 \ A$

$i_3 = 21 \ A$

$V_x = (i_3 - i_1) 4$
$= (21 - 15) 4$
$= 24 \ V$

Örnek
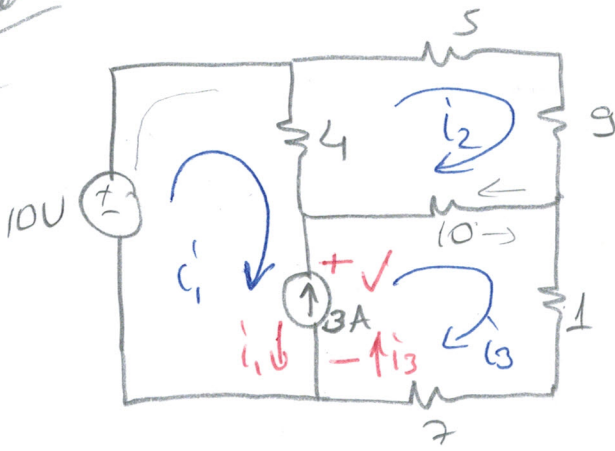
10 V'luk kaynaktan çıkan akımı bulunuz

- Göz 1 => $-10 + 4(i_1 - i_2) + V = 0$

- Göz 3 => $i_3 + 7i_3 - V + 10(i_3 - i_2) =$

  $-10 + 4i_1 - 4i_2 + 8i_3 + 10i_3 - 10i_2 = 0$

  $4i_1 - 14i_2 + 18i_3 = 10$ ___ ①

- Göz 2 => $4(i_2 - i_1) + 5i_2 + 9i_2 + 10(i_2 - i_3) = 0$

  $4i_2 - 4i_1 + 14i_2 + 10i_2 - 10i_3 = 0$

  $-4i_1 + 28i_2 - 10i_3 = 0$ ___ ②

- $i_3 - i_1 = 3$ ___ ③

  $i_3 = 3 + i_1$

① ve ③'den

  $4i_1 - 14i_2 + 54 + 18i_1 = 10$

  $22i_1 - 14i_2 = -44$

  ⑤

② ve ③'den

  $-4i_1 + 28i_2 - 30 - 10i_1 = 0$

  $-14i_1 + 28i_2 = 30$ ___ ④

④ ve ⑤ çözülür

  $2/ \quad 22i_1 - 14i_2 = -44$

  $\underline{\quad -14i_1 + 28i_2 = 30}$

  $\underline{+ \quad 44i_1 - 28i_2 = -88}$

  $30i_1 = -58$

  $i_1 = -1,93A$

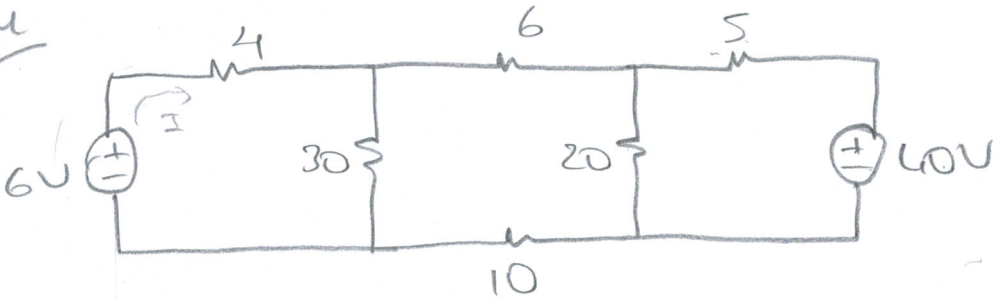# 3.3) Kaynak Dönüşümü
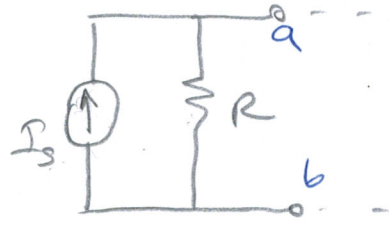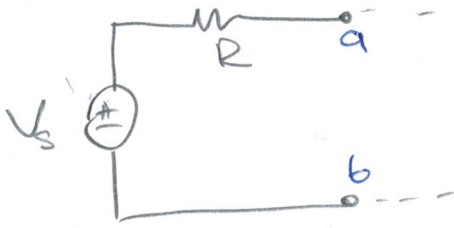
$$V_S = I_S R$$

örnek
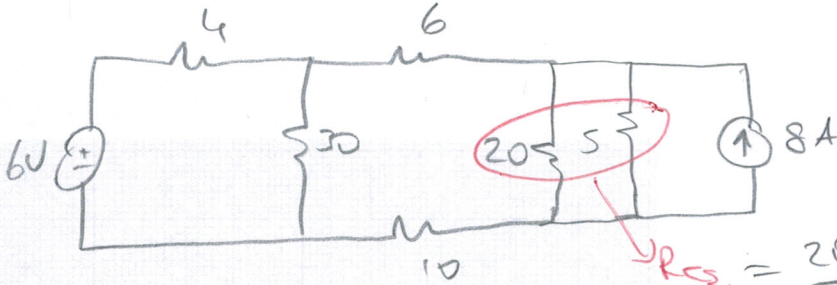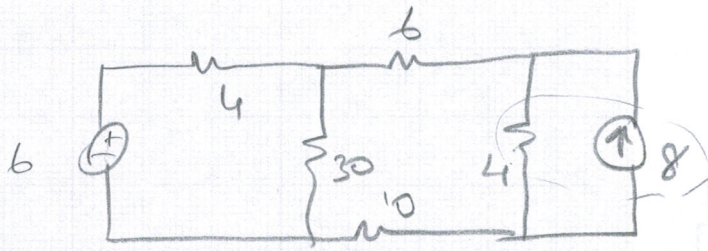

$P_{6V} = ?$

$P = V I$

Kaynak dönüşüm kullanarak çözün
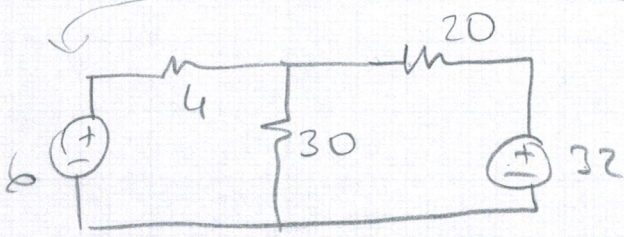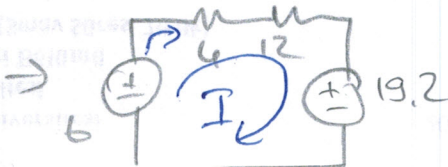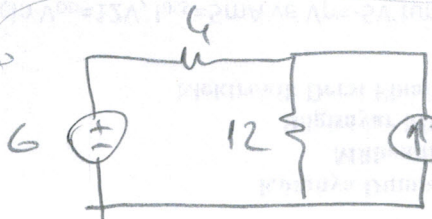
$$I_S = \frac{40}{5} = 8A$$

$R_{es_1} = \frac{20 \cdot 5}{\frac{25}{5}} = 4\Omega$

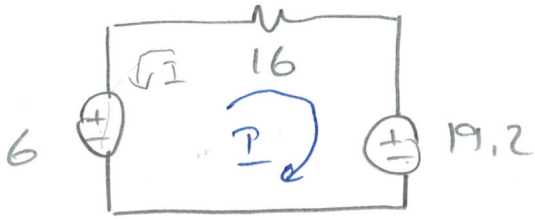

$$V_S = 8 \cdot 4 = 32V$$

$R_{es} = \frac{30 \cdot 20}{50} = 12$

19,2

$$-6 + 16I + 19{,}2 = 0$$

$$I = -0{,}825A$$

$$P_{6v} = U \cdot I = 6 \cdot 0{,}825 = 4{,}95\,w$$