

# **Esercizi di Elettrotecnica**

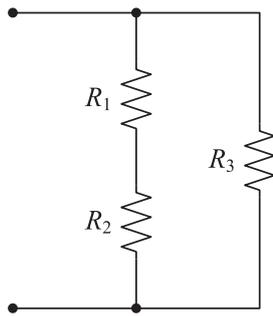
**Circuiti in corrente continua**

**Parte 1**

[www.die.ing.unibo.it/pers/mastri/didattica.htm](http://www.die.ing.unibo.it/pers/mastri/didattica.htm)

(versione del 24-5-2011)



**Esercizio n. 1**

$$R_1 = 10 \, \Omega$$

$$R_2 = 30 \, \Omega$$

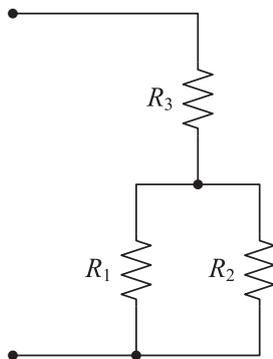
$$R_3 = 10 \, \Omega$$

Determinare la resistenza equivalente del bipolo rappresentato in figura.

**Risultato**

$$R_{eq} = 8 \, \Omega$$


---

**Esercizio n. 2**

$$R_1 = 14 \, \Omega$$

$$R_2 = 35 \, \Omega$$

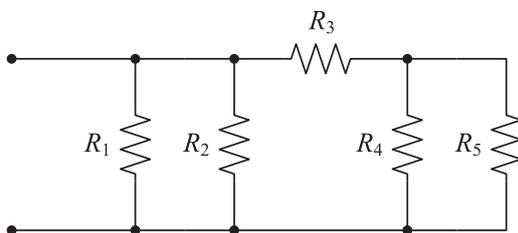
$$R_3 = 20 \, \Omega$$

Determinare la resistenza equivalente del bipolo rappresentato in figura.

**Risultato**

$$R_{eq} = 30 \, \Omega$$


---

**Esercizio n. 3**

$$R_1 = 6 \, \Omega$$

$$R_2 = 20 \, \Omega$$

$$R_3 = 15 \, \Omega$$

$$R_4 = 20 \, \Omega$$

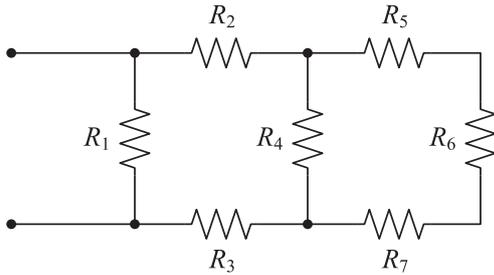
$$R_5 = 60 \, \Omega$$

Determinare la resistenza equivalente del bipolo rappresentato in figura.

**Risultato**

$$R_{eq} = 4 \, \Omega$$


---

**Esercizio n. 4**

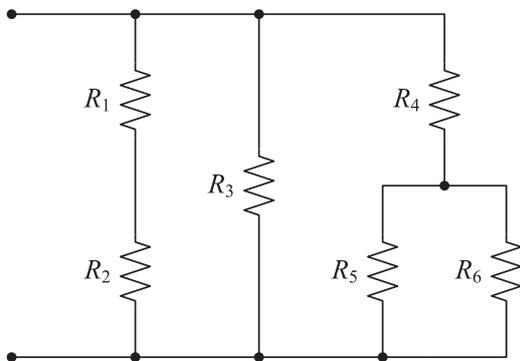
$$\begin{aligned} R_1 &= 4 \, \Omega \\ R_2 &= 2 \, \Omega \\ R_3 &= 6 \, \Omega \\ R_4 &= 5 \, \Omega \\ R_5 &= 4 \, \Omega \\ R_6 &= 6 \, \Omega \\ R_7 &= 10 \, \Omega \end{aligned}$$

Determinare la resistenza equivalente del bipolo rappresentato in figura.

**Risultato**

$$R_{eq} = 3 \, \Omega$$


---

**Esercizio n. 5**

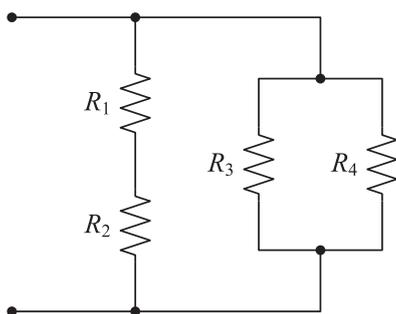
$$\begin{aligned} R_1 &= 10 \, \Omega \\ R_2 &= 20 \, \Omega \\ R_3 &= 15 \, \Omega \\ R_4 &= 5 \, \Omega \\ R_5 &= 15 \, \Omega \\ R_6 &= 30 \, \Omega \end{aligned}$$

Determinare la resistenza equivalente del bipolo rappresentato in figura.

**Risultato**

$$R_{eq} = 6 \, \Omega$$


---

**Esercizio n. 6**

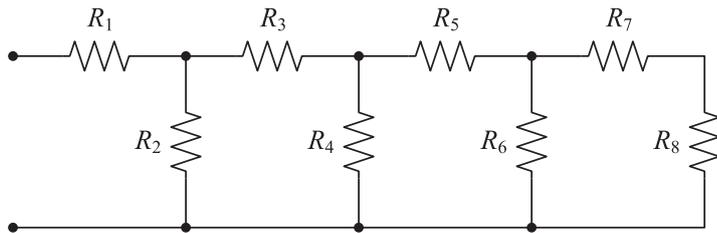
$$\begin{aligned} R_1 &= 10 \, \Omega \\ R_2 &= 20 \, \Omega \\ R_3 &= 20 \, \Omega \\ R_4 &= 60 \, \Omega \end{aligned}$$

Determinare la resistenza equivalente del bipolo rappresentato in figura.

**Risultato**

$$R_{eq} = 10 \, \Omega$$


---

**Esercizio n. 7**

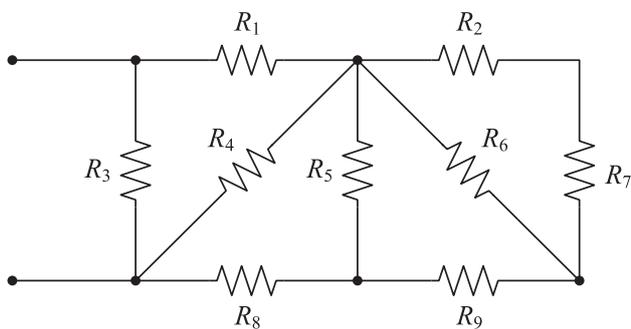
$$\begin{array}{ll} R_1 = 2 \, \Omega & R_5 = 4 \, \Omega \\ R_2 = 3 \, \Omega & R_6 = 3 \, \Omega \\ R_3 = 3 \, \Omega & R_7 = 2 \, \Omega \\ R_4 = 6 \, \Omega & R_8 = 4 \, \Omega \end{array}$$

Determinare la resistenza equivalente del bipolo rappresentato in figura.

**Risultato**

$$R_{eq} = 4 \, \Omega$$


---

**Esercizio n. 8**

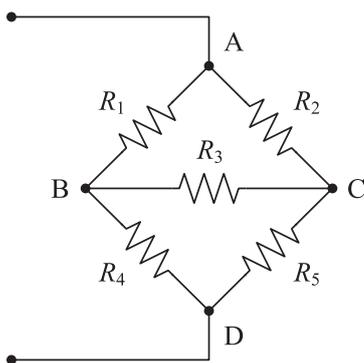
$$\begin{array}{ll} R_1 = 2 \, \Omega & R_6 = 4 \, \Omega \\ R_2 = 4 \, \Omega & R_7 = 8 \, \Omega \\ R_3 = 3 \, \Omega & R_8 = 4 \, \Omega \\ R_4 = 8 \, \Omega & R_9 = 9 \, \Omega \\ R_5 = 6 \, \Omega & \end{array}$$

Determinare la resistenza equivalente del bipolo rappresentato in figura.

**Risultato**

$$R_{eq} = 2 \, \Omega$$


---

**Esercizio n. 9**

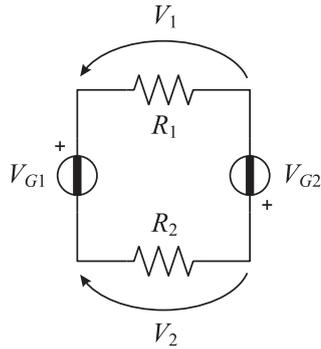
$$\begin{array}{l} R_1 = 12 \, \Omega \\ R_2 = 18 \, \Omega \\ R_3 = 6 \, \Omega \\ R_4 = 4 \, \Omega \\ R_5 = 3 \, \Omega \end{array}$$

Determinare la resistenza equivalente del bipolo rappresentato in figura.

**Risultato**

$$R_{eq} = 9 \, \Omega$$


---

**Esercizio n. 10**

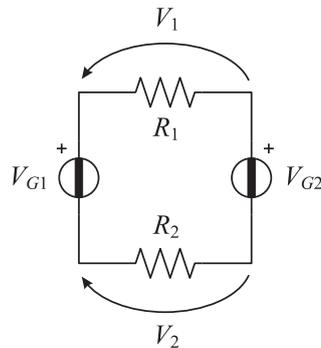
$$\begin{aligned} R_1 &= 2 \, \Omega \\ R_2 &= 3 \, \Omega \\ V_{G1} &= 15 \, \text{V} \\ V_{G2} &= 10 \, \text{V} \end{aligned}$$

Determinare le tensioni  $V_1$  e  $V_2$ , le potenze  $P_1$  e  $P_2$  assorbite dai resistori e le potenze  $P_{G1}$  e  $P_{G2}$  erogate dai generatori.

**Risultati**

$$V_1 = 10 \, \text{V}, V_2 = -15 \, \text{V}, P_1 = 50 \, \text{W}, P_2 = 75 \, \text{W}, P_{G1} = 75 \, \text{W}, P_{G2} = 50 \, \text{W}$$


---

**Esercizio n. 11**

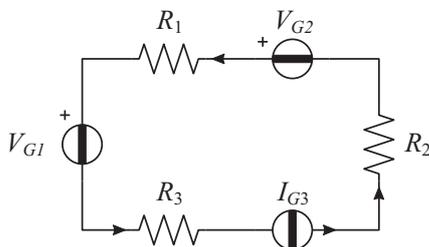
$$\begin{aligned} R_1 &= 2 \, \Omega \\ R_2 &= 3 \, \Omega \\ V_{G1} &= 15 \, \text{V} \\ V_{G2} &= 10 \, \text{V} \end{aligned}$$

Determinare le tensioni  $V_1$  e  $V_2$ , le potenze  $P_1$  e  $P_2$  assorbite dai resistori e le potenze  $P_{G1}$  e  $P_{G2}$  erogate dai generatori.

**Risultati**

$$V_1 = 2 \, \text{V}, V_2 = -3 \, \text{V}, P_1 = 2 \, \text{W}, P_2 = 3 \, \text{W}, P_{G1} = 15 \, \text{W}, P_{G2} = -10 \, \text{W}$$


---

**Esercizio n. 12**

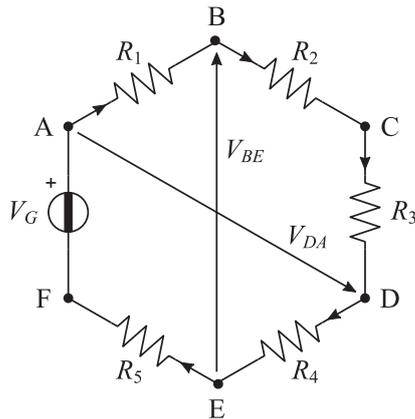
$$\begin{aligned} R_1 &= 4 \, \Omega \\ R_2 &= 2 \, \Omega \\ R_3 &= 3 \, \Omega \\ V_{G1} &= 6 \, \text{V} \\ V_{G2} &= 12 \, \text{V} \\ I_{G3} &= 2 \, \text{A} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= 8 \, \text{V} & I_1 &= 2 \, \text{A} \\ V_2 &= 4 \, \text{V} & I_2 &= 2 \, \text{A} \\ V_3 &= 6 \, \text{V} & I_3 &= 2 \, \text{A} \\ P_{G1} &= -12 \, \text{W}, P_{G2} = 24 \, \text{W}, P_{G3} = 24 \, \text{W} \end{aligned}$$


---

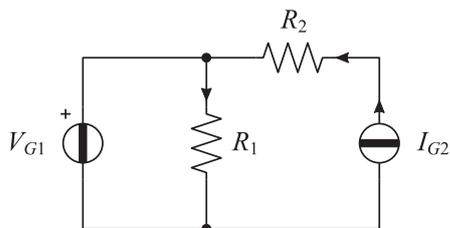
**Esercizio n. 13**

$$\begin{aligned} R_1 &= 10 \, \Omega \\ R_2 &= 5 \, \Omega \\ R_3 &= 15 \, \Omega \\ R_4 &= 20 \, \Omega \\ R_5 &= 30 \, \Omega \\ V_G &= 16 \, \text{V} \end{aligned}$$

Determinare le tensioni  $V_{BE}$  e  $V_{DA}$  e la potenza  $P_G$  erogata dal generatore.

**Risultati**

$$V_{BE} = 8 \, \text{V}, \quad V_{DA} = -6 \, \text{V}, \quad P_G = 3.2 \, \text{W}$$

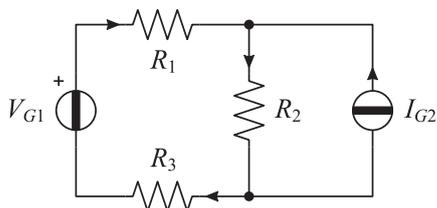
**Esercizio n. 14**

$$\begin{aligned} R_1 &= 5 \, \Omega \\ R_2 &= 2 \, \Omega \\ V_{G1} &= 10 \, \text{V} \\ I_{G2} &= 4 \, \text{A} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= 10 \, \text{V} & I_1 &= 2 \, \text{A} \\ V_2 &= 8 \, \text{V} & I_2 &= 4 \, \text{A} \\ P_{G1} &= -20 \, \text{W} & P_{G2} &= 72 \, \text{W} \end{aligned}$$

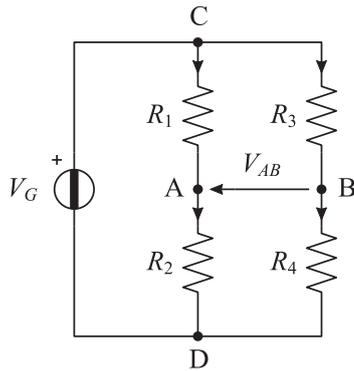
**Esercizio n. 15**

$$\begin{aligned} R_1 &= 5 \, \Omega \\ R_2 &= 5 \, \Omega \\ R_3 &= 10 \, \Omega \\ V_{G1} &= 30 \, \text{V} \\ I_{G2} &= 2 \, \text{A} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori e le potenze  $P_{G1}$  e  $P_{G2}$  erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= 5 \, \text{V} & I_1 &= 1 \, \text{A} \\ V_2 &= 15 \, \text{V} & I_2 &= 3 \, \text{A} \\ V_3 &= 10 \, \text{V} & I_3 &= 1 \, \text{A} \\ P_{G1} &= 30 \, \text{W} & P_{G2} &= 30 \, \text{W} \end{aligned}$$

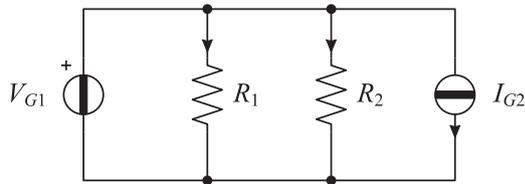
**Esercizio n. 16**

$$\begin{aligned} R_1 &= 2 \, \Omega \\ R_2 &= 4 \, \Omega \\ R_3 &= 3 \, \Omega \\ R_4 &= 3 \, \Omega \\ V_G &= 12 \, \text{V} \end{aligned}$$

Determinare la tensione  $V_{AB}$ .

**Risultato**

$$V_{AB} = 2 \, \text{V}$$

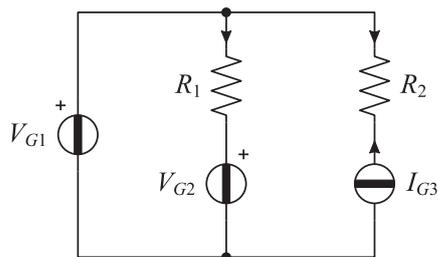
**Esercizio n. 17**

$$\begin{aligned} R_1 &= 3 \, \Omega \\ R_2 &= 4 \, \Omega \\ V_{G1} &= 12 \, \text{V} \\ I_{G2} &= 2 \, \text{A} \end{aligned}$$

Determinare le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$I_1 = 4 \, \text{A}, I_2 = 3 \, \text{A}, P_{G1} = 108 \, \text{W}, P_{G2} = -24 \, \text{W}$$

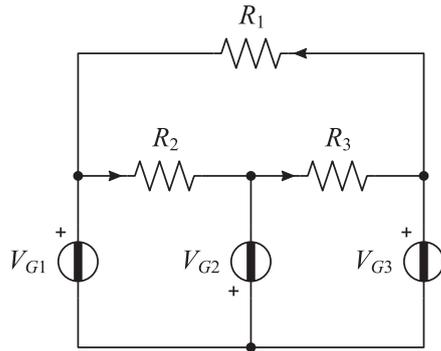
**Esercizio n. 18**

$$\begin{aligned} R_1 &= 10 \, \Omega \\ R_2 &= 5 \, \Omega \\ V_{G1} &= 30 \, \text{V} \\ V_{G2} &= 10 \, \text{V} \\ I_{G3} &= 2 \, \text{A} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= 20 \, \text{V} & I_1 &= 2 \, \text{A} \\ V_2 &= -10 & I_2 &= -2 \, \text{A} \\ P_{G1} &= 0 \, \text{W}, P_{G2} = -20 \, \text{W}, P_{G3} &= 80 \, \text{W} \end{aligned}$$

**Esercizio n. 19**

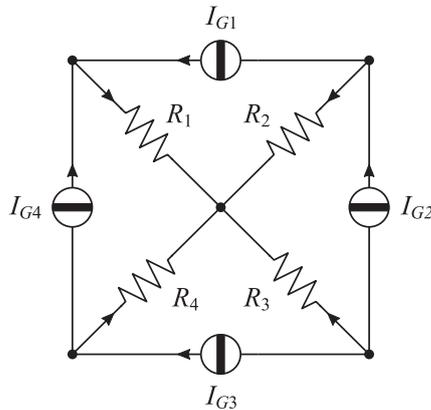
$$\begin{aligned} R_1 &= 5 \, \Omega \\ R_2 &= 5 \, \Omega \\ R_3 &= 5 \, \Omega \\ V_{G1} &= 10 \, \text{V} \\ V_{G2} &= 20 \, \text{V} \\ V_{G3} &= 30 \, \text{V} \end{aligned}$$

Determinare le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$I_1 = 4 \, \text{A}, I_2 = 6 \, \text{A}, I_3 = -10 \, \text{A}, P_{G1} = 20 \, \text{W}, P_{G2} = 320 \, \text{W}, P_{G3} = 420 \, \text{W}$$


---

**Esercizio n. 20**

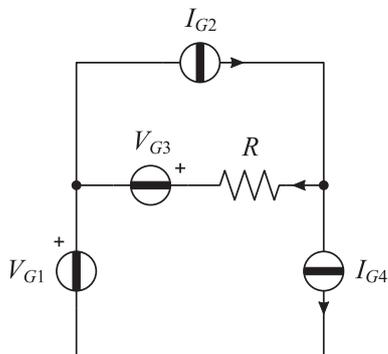
$$\begin{aligned} R_1 &= 4 \, \Omega \\ R_2 &= 5 \, \Omega \\ R_3 &= 5 \, \Omega \\ R_4 &= 5 \, \Omega \\ I_{G1} &= 3 \, \text{A} \\ I_{G2} &= 4 \, \text{A} \\ I_{G3} &= 4 \, \text{A} \\ I_{G4} &= 2 \, \text{A} \end{aligned}$$

Determinare le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$I_1 = 5 \, \text{A}, I_2 = 1 \, \text{A}, I_3 = -8 \, \text{A}, I_4 = 2 \, \text{A}, P_{G1} = 45 \, \text{W}, P_{G2} = 180 \, \text{W}, P_{G3} = 200 \, \text{W}, P_{G4} = 20 \, \text{W}$$


---

**Esercizio n. 21**

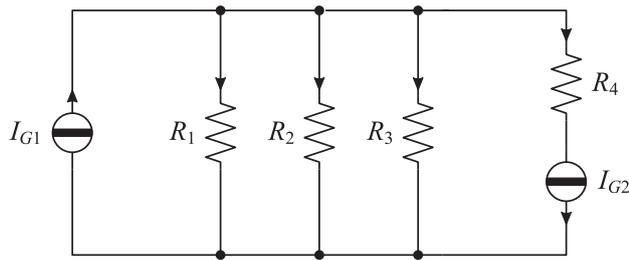
$$\begin{aligned} R &= 5 \, \Omega \\ V_{G1} &= 10 \, \text{V} \\ I_{G2} &= 5 \, \text{A} \\ V_{G3} &= 5 \, \text{V} \\ I_{G4} &= 2 \, \text{A} \end{aligned}$$

Determinare le potenze erogate dai generatori.

**Risultati**

$$P_{G1} = 20 \, \text{W}, P_{G2} = 100 \, \text{W}, P_{G3} = -15 \, \text{W}, P_{G4} = -60 \, \text{W}$$


---

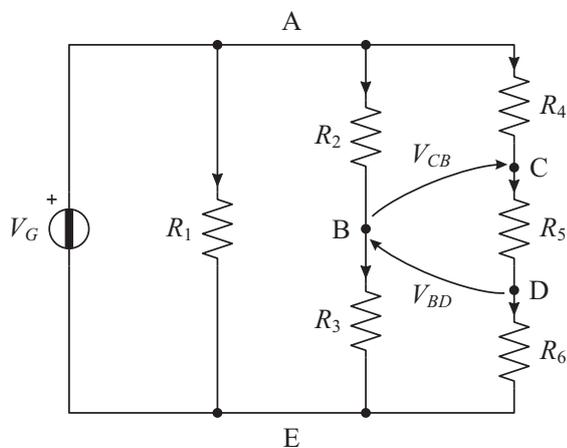
**Esercizio n. 22**

$$\begin{aligned} R_1 &= 10 \, \Omega \\ R_2 &= 30 \, \Omega \\ R_3 &= 15 \, \Omega \\ R_4 &= 10 \, \Omega \\ I_{G1} &= 12 \, \text{A} \\ I_{G2} &= 3 \, \text{A} \end{aligned}$$

Determinare le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$I_1 = 4.5 \, \text{A}, I_2 = 1.5 \, \text{A}, I_3 = 3 \, \text{A}, I_4 = 3 \, \text{A}, P_{G1} = 540 \, \text{W}, P_{G2} = -45 \, \text{W}$$

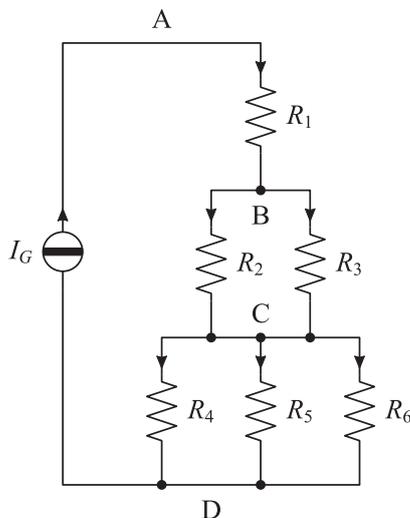
**Esercizio n. 23**

$$\begin{aligned} R_1 &= 6 \, \Omega \\ R_2 &= 8 \, \Omega \\ R_3 &= 4 \, \Omega \\ R_4 &= 3 \, \Omega \\ R_5 &= 3 \, \Omega \\ R_6 &= 6 \, \Omega \\ V_G &= 24 \, \text{V} \end{aligned}$$

Determinare le tensioni  $V_{CB}$  e  $V_{BD}$  e la potenza erogata dal generatore.

**Risultati**

$$V_{BD} = -4 \, \text{V}, V_{CB} = 10 \, \text{V}, P_G = 192 \, \text{W}$$

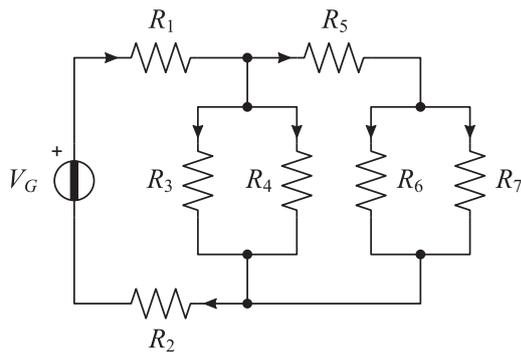
**Esercizio n. 24**

$$\begin{aligned} R_1 &= 4 \, \Omega \\ R_2 &= 5 \, \Omega \\ R_3 &= 20 \, \Omega \\ R_4 &= 40 \, \Omega \\ R_5 &= 10 \, \Omega \\ R_6 &= 8 \, \Omega \\ I_G &= 5 \, \text{A} \end{aligned}$$

Determinare le correnti dei resistori e la potenza  $P_G$  erogata dal generatore.

**Risultati**

$$I_1 = 5 \, \text{A}, I_2 = 4 \, \text{A}, I_3 = 1 \, \text{A}, I_4 = 0.5 \, \text{A}, I_5 = 2 \, \text{A}, I_6 = 2.5 \, \text{A}, P_G = 300 \, \text{W}$$

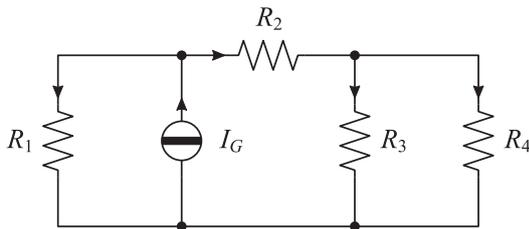
**Esercizio n. 25**

$$\begin{aligned} R_1 &= 6 \, \Omega \\ R_2 &= 3 \, \Omega \\ R_3 &= 2 \, \Omega \\ R_4 &= 3 \, \Omega \\ R_5 &= 4 \, \Omega \\ R_6 &= 3 \, \Omega \\ R_7 &= 6 \, \Omega \\ V_G &= 90 \, \text{V} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori.

**Risultati**

$$\begin{aligned} V_1 &= 54 \, \text{V} & I_1 &= 9 \, \text{A} \\ V_2 &= 27 \, \text{V} & I_2 &= 9 \, \text{A} \\ V_3 &= 9 \, \text{V} & I_3 &= 4.5 \, \text{A} \\ V_4 &= 9 \, \text{V} & I_4 &= 3 \, \text{A} \\ V_5 &= 6 \, \text{V} & I_5 &= 1.5 \, \text{A} \\ V_6 &= 3 \, \text{V} & I_6 &= 1 \, \text{A} \\ V_7 &= 3 \, \text{V} & I_7 &= 0.5 \, \text{A} \end{aligned}$$

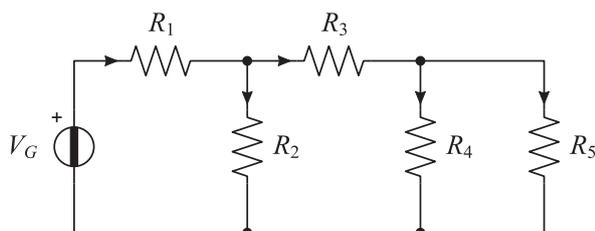
**Esercizio n. 26**

$$\begin{aligned} R_1 &= 12 \, \Omega \\ R_2 &= 2 \, \Omega \\ R_3 &= 6 \, \Omega \\ R_4 &= 3 \, \Omega \\ I_G &= 4 \, \text{A} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori.

**Risultati**

$$\begin{aligned} V_1 &= 12 \, \text{V} & I_1 &= 1 \, \text{A} \\ V_2 &= 6 \, \text{V} & I_2 &= 3 \, \text{A} \\ V_3 &= 6 \, \text{V} & I_3 &= 1 \, \text{A} \\ V_4 &= 6 \, \text{V} & I_4 &= 2 \, \text{A} \end{aligned}$$

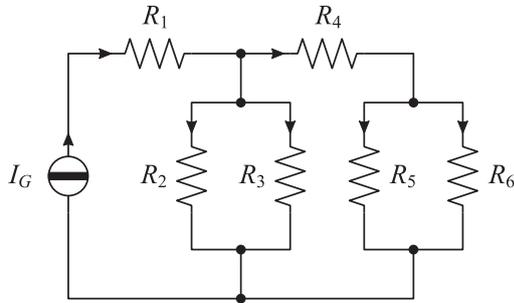
**Esercizio n. 27**

$$\begin{aligned} R_1 &= 4 \, \Omega \\ R_2 &= 15 \, \Omega \\ R_3 &= 6 \, \Omega \\ R_4 &= 5 \, \Omega \\ R_5 &= 20 \, \Omega \\ V_G &= 25 \, \text{V} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori.

**Risultati**

$V_1 = 10 \text{ V}$	$I_1 = 2.5 \text{ A}$
$V_2 = 15 \text{ V}$	$I_2 = 1 \text{ A}$
$V_3 = 9 \text{ V}$	$I_3 = 1.5 \text{ A}$
$V_4 = 6 \text{ V}$	$I_4 = 1.2 \text{ A}$
$V_5 = 6 \text{ V}$	$I_5 = 0.3 \text{ A}$

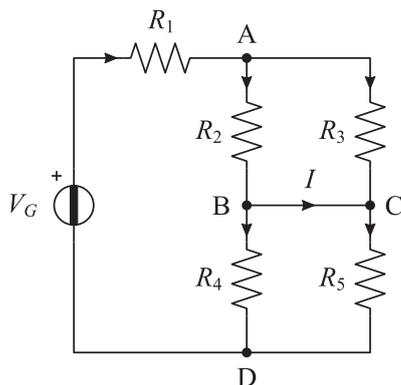
**Esercizio n. 28**

$R_1 = 3 \Omega$
$R_2 = 2 \Omega$
$R_3 = 6 \Omega$
$R_4 = 2 \Omega$
$R_5 = 2 \Omega$
$R_6 = 2 \Omega$
$I_G = 6 \text{ A}$

Determinare le correnti dei resistori e la potenza erogata dal generatore.

**Risultati**

$I_1 = 6 \text{ A}$ , $I_2 = 3 \text{ A}$ , $I_3 = 1 \text{ A}$ , $I_4 = 2 \text{ A}$ , $I_5 = 1 \text{ A}$ , $I_6 = 1 \text{ A}$ , $P_G = 144 \text{ W}$
---

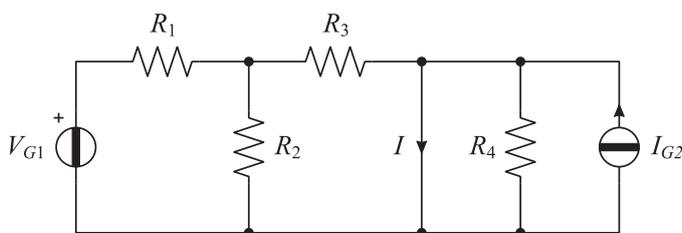
**Esercizio n. 29**

$R_1 = 6 \Omega$
$R_2 = 10 \Omega$
$R_3 = 15 \Omega$
$R_4 = 12 \Omega$
$R_5 = 6 \Omega$
$V_G = 45 \text{ V}$

Determinare la corrente I.

**Risultato**

$I = 0.75 \text{ A}$
----------------------

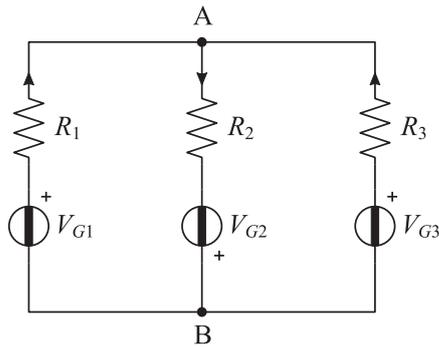
**Esercizio n. 30**

$R_1 = 3 \Omega$
$R_2 = 4 \Omega$
$R_3 = 12 \Omega$
$V_{G1} = 24 \text{ V}$
$I_{G2} = 2 \text{ A}$

Determinare la corrente I.

**Risultato**

$I = 3 \text{ A}$
-------------------

**Esercizio n. 31**

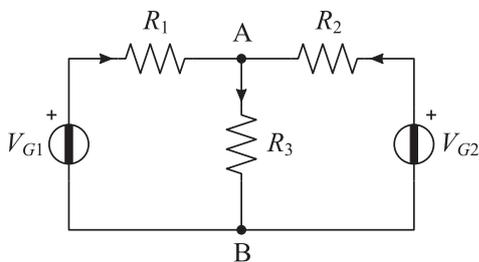
$$\begin{aligned} R_1 &= 50 \, \Omega \\ R_2 &= 25 \, \Omega \\ R_3 &= 25 \, \Omega \\ V_{G1} &= 150 \, \text{V} \\ V_{G2} &= 150 \, \text{V} \\ V_{G3} &= 200 \, \text{V} \end{aligned}$$

Determinare le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$I_1 = 2 \, \text{A}, I_2 = 8 \, \text{A}, I_3 = 6 \, \text{A}, P_{G1} = 300 \, \text{W}, P_{G2} = 1200 \, \text{W}, P_{G3} = 1200 \, \text{W}$$


---

**Esercizio n. 32**

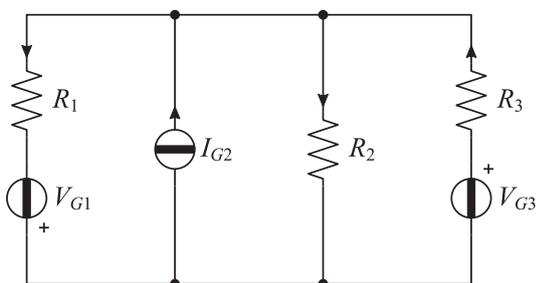
$$\begin{aligned} R_1 &= 3 \, \Omega \\ R_2 &= 2 \, \Omega \\ R_3 &= 6 \, \Omega \\ V_{G1} &= 9 \, \text{V} \\ V_{G2} &= 18 \, \text{V} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= -3 \, \text{V} & I_1 &= -1 \, \text{A} \\ V_2 &= 6 \, \text{V} & I_2 &= 3 \, \text{A} \\ V_3 &= 12 \, \text{V} & I_3 &= 2 \, \text{A} \\ P_{G1} &= -9 \, \text{W} & P_{G2} &= 54 \, \text{W} \end{aligned}$$


---

**Esercizio n. 33**

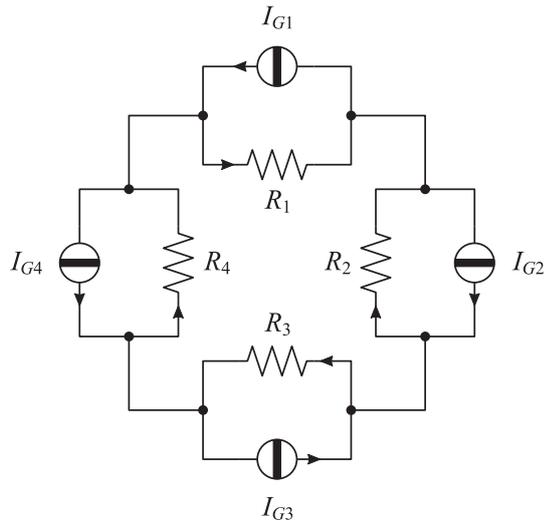
$$\begin{aligned} R_1 &= 12 \, \Omega \\ R_2 &= 6 \, \Omega \\ R_3 &= 3 \, \Omega \\ V_{G1} &= 12 \, \text{V} \\ I_{G2} &= 5 \, \text{A} \\ V_{G3} &= 30 \, \text{V} \end{aligned}$$

Determinare le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$I_1 = 3 \, \text{A}, I_2 = 4 \, \text{A}, I_3 = 2 \, \text{A}, P_{G1} = 36 \, \text{W}, P_{G2} = 120 \, \text{W}, P_{G3} = 60 \, \text{W}$$


---

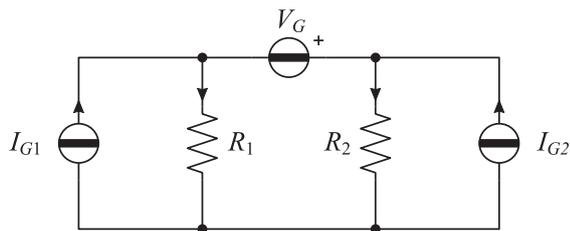
**Esercizio n. 34**

$$\begin{aligned} R_1 &= 5 \, \Omega \\ R_2 &= 3 \, \Omega \\ R_3 &= 5 \, \Omega \\ R_4 &= 5 \, \Omega \\ I_{G1} &= 6 \, \text{A} \\ I_{G2} &= 2 \, \text{A} \\ I_{G3} &= 2 \, \text{A} \\ I_{G4} &= 4 \, \text{A} \end{aligned}$$

Determinare le tensioni dei resistori e le potenze erogate dai generatori.

**Risultati**

$$V_1 = 15 \, \text{V}, V_2 = 15 \, \text{V}, V_3 = -5 \, \text{V}, V_4 = 5 \, \text{V}, P_{G1} = 90 \, \text{W}, P_{G2} = 30 \, \text{W}, P_{G3} = -10 \, \text{W}, P_{G4} = 20 \, \text{W}$$

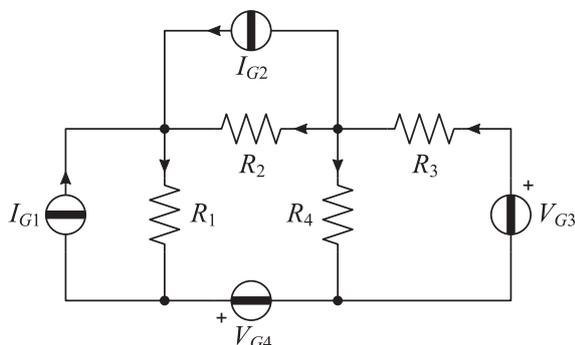
**Esercizio n. 35**

$$\begin{aligned} R_1 &= 2 \, \Omega \\ R_2 &= 4 \, \Omega \\ I_{G1} &= 4 \, \text{A} \\ I_{G2} &= 3 \, \text{A} \\ V_G &= 10 \, \text{V} \end{aligned}$$

Determinare le tensioni dei resistori e le potenze erogate dai generatori.

**Risultati**

$$V_1 = 6 \, \text{V}, V_2 = 16 \, \text{V}, P_{G1} = 24 \, \text{W}, P_{G2} = 48 \, \text{W}, P_{G3} = 10 \, \text{W}$$

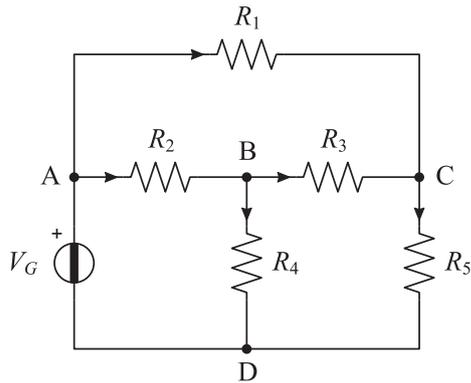
**Esercizio n. 36**

$$\begin{aligned} R_1 &= 3 \, \Omega \\ R_2 &= 2 \, \Omega \\ R_3 &= 6 \, \Omega \\ R_4 &= 12 \, \Omega \\ I_{G1} &= 2 \, \text{A} \\ I_{G2} &= 3 \, \text{A} \\ V_{G3} &= 18 \, \text{V} \\ V_{G4} &= 3 \, \text{V} \end{aligned}$$

Determinare le tensioni dei resistori e le potenze erogate dai generatori.

**Risultati**

$$V_1 = 9 \, \text{V}, V_2 = -4 \, \text{V}, V_3 = 10 \, \text{V}, V_4 = 8 \, \text{V}, P_{G1} = 18 \, \text{W}, P_{G2} = 12 \, \text{W}, P_{G3} = 30 \, \text{W}, P_{G4} = -3 \, \text{W}$$

**Esercizio n. 37**

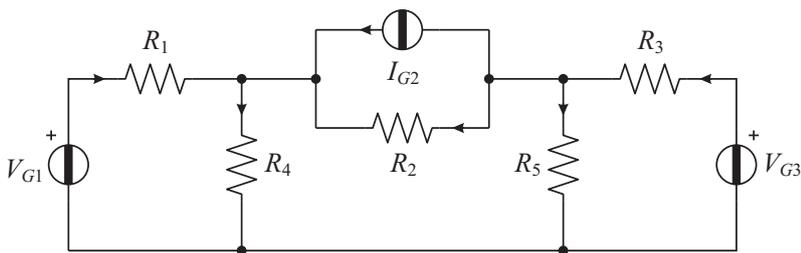
$$\begin{aligned} R_1 &= 6 \, \Omega \\ R_2 &= 24 \, \Omega \\ R_3 &= 6 \, \Omega \\ R_4 &= 6 \, \Omega \\ R_5 &= 9 \, \Omega \\ V_G &= 36 \, \text{V} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori.

**Risultati**

$$\begin{aligned} V_1 &= 18 \, \text{V} & I_1 &= 3 \, \text{A} \\ V_2 &= 24 \, \text{V} & I_2 &= 1 \, \text{A} \\ V_3 &= -6 \, \text{V} & I_3 &= -1 \, \text{A} \\ V_4 &= 12 \, \text{V} & I_4 &= 2 \, \text{A} \\ V_5 &= 18 \, \text{V} & I_5 &= 2 \, \text{A} \end{aligned}$$


---

**Esercizio n. 38**

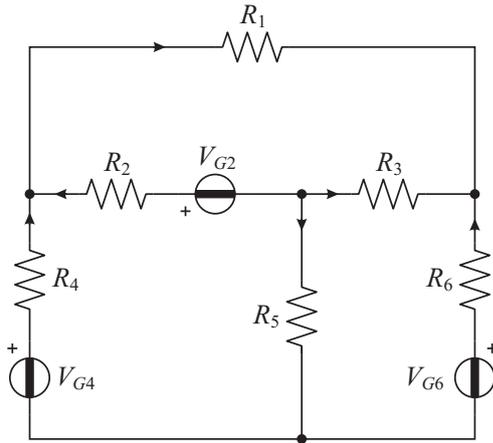
$$\begin{aligned} R_1 &= 6 \, \Omega \\ R_2 &= 6 \, \Omega \\ R_3 &= 2 \, \Omega \\ R_4 &= 2 \, \Omega \\ R_5 &= 18 \, \Omega \\ V_{G1} &= 24 \, \text{V} \\ I_{G2} &= 3 \, \text{A} \\ V_{G3} &= 28 \, \text{V} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= 12 \, \text{V} & I_1 &= 2 \, \text{A} \\ V_2 &= 6 \, \text{V} & I_2 &= 1 \, \text{A} \\ V_3 &= 10 \, \text{V} & I_3 &= 5 \, \text{A} \\ V_4 &= 12 \, \text{V} & I_4 &= 6 \, \text{A} \\ V_5 &= 18 \, \text{V} & I_5 &= 1 \, \text{A} \\ P_{G1} &= 48 \, \text{W}, P_{G2} = -18 \, \text{W}, P_{G3} = 140 \, \text{W} \end{aligned}$$


---

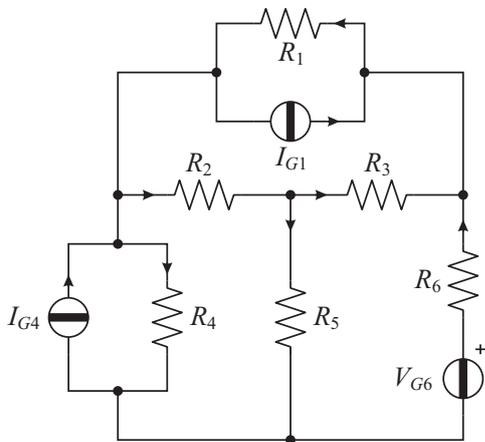
**Esercizio n. 39**

$$\begin{aligned} R_1 &= 3 \, \Omega \\ R_2 &= 3 \, \Omega \\ R_3 &= 3 \, \Omega \\ R_4 &= 1 \, \Omega \\ R_5 &= 1 \, \Omega \\ R_6 &= 4 \, \Omega \\ V_{G2} &= 18 \, \text{V} \\ V_{G4} &= 18 \, \text{V} \\ V_{G6} &= 3 \, \text{V} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= 9 \, \text{V} & I_1 &= 3 \, \text{A} \\ V_2 &= 3 \, \text{V} & I_2 &= 1 \, \text{A} \\ V_3 &= -6 \, \text{V} & I_3 &= -2 \, \text{A} \\ V_4 &= 2 \, \text{V} & I_4 &= 2 \, \text{A} \\ V_5 &= 1 \, \text{V} & I_5 &= 1 \, \text{A} \\ V_6 &= -4 \, \text{V} & I_6 &= -1 \, \text{A} \\ P_{G2} &= 18 \, \text{W}, P_{G4} = 36 \, \text{W}, P_{G6} = -3 \, \text{W} \end{aligned}$$

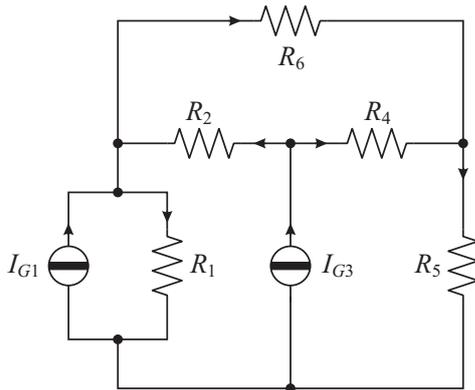
**Esercizio n. 40**

$$\begin{aligned} R_1 &= 10 \, \Omega \\ R_2 &= 5 \, \Omega \\ R_3 &= 10 \, \Omega \\ R_4 &= 10 \, \Omega \\ R_5 &= 2 \, \Omega \\ R_6 &= 10 \, \Omega \\ I_{G1} &= 7 \, \text{A} \\ I_{G4} &= 9 \, \text{A} \\ V_{G6} &= 20 \, \text{V} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= 20 \, \text{V} & I_1 &= 2 \, \text{A} \\ V_2 &= 10 \, \text{V} & I_2 &= 2 \, \text{A} \\ V_3 &= -30 \, \text{V} & I_3 &= -3 \, \text{A} \\ V_4 &= 20 \, \text{V} & I_4 &= 2 \, \text{A} \\ V_5 &= 10 \, \text{V} & I_5 &= 5 \, \text{A} \\ V_6 &= -20 \, \text{V} & I_6 &= -2 \, \text{A} \\ P_{G1} &= 140 \, \text{W}, P_{G4} = 180 \, \text{W}, P_{G6} = -40 \, \text{W} \end{aligned}$$

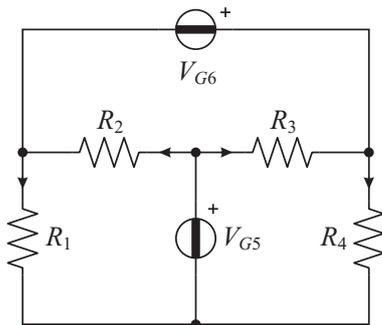
**Esercizio n. 41**

$$\begin{aligned} R_1 &= 4 \, \Omega \\ R_2 &= 3 \, \Omega \\ R_4 &= 3 \, \Omega \\ R_5 &= 1 \, \Omega \\ R_6 &= 2 \, \Omega \\ I_{G1} &= 5 \, \text{A} \\ I_{G3} &= 4 \, \text{A} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= 12 \, \text{V} & I_1 &= 3 \, \text{A} \\ V_2 &= 3 \, \text{V} & I_2 &= 1 \, \text{A} \\ V_4 &= 9 \, \text{V} & I_4 &= 3 \, \text{A} \\ V_5 &= 6 \, \text{V} & I_5 &= 6 \, \text{A} \\ V_6 &= 6 \, \text{V} & I_6 &= 3 \, \text{A} \\ P_{G1} &= 60 \, \text{W} & P_{G3} &= 60 \, \text{W} \end{aligned}$$

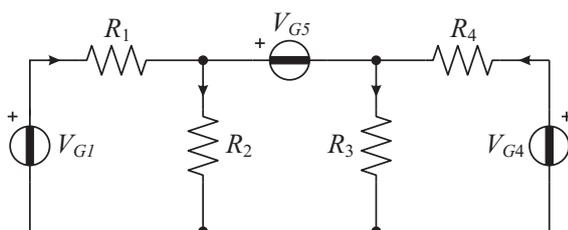
**Esercizio n. 42**

$$\begin{aligned} R_1 &= 10 \, \Omega \\ R_2 &= 2 \, \Omega \\ R_3 &= 10 \, \Omega \\ R_4 &= 20 \, \Omega \\ V_{G5} &= 20 \, \text{V} \\ V_{G6} &= 30 \, \text{V} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= 10 \, \text{V} & I_1 &= 1 \, \text{A} \\ V_2 &= 10 \, \text{V} & I_2 &= 5 \, \text{A} \\ V_3 &= -20 \, \text{V} & I_3 &= -2 \, \text{A} \\ V_4 &= 40 \, \text{V} & I_4 &= 2 \, \text{A} \\ P_{G5} &= 60 \, \text{W} & P_{G6} &= 120 \, \text{W} \end{aligned}$$

**Esercizio n. 43**

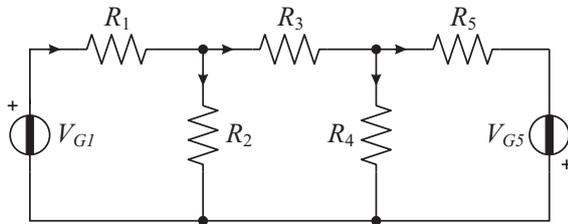
$$\begin{aligned} R_1 &= 3 \, \Omega \\ R_2 &= 3 \, \Omega \\ R_3 &= 3 \, \Omega \\ R_4 &= 3 \, \Omega \\ V_{G1} &= 18 \, \text{V} \\ V_{G4} &= 18 \, \text{V} \\ V_{G5} &= 6 \, \text{V} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= 6 \text{ V} & I_1 &= 2 \text{ A} \\ V_2 &= 12 \text{ V} & I_2 &= 4 \text{ A} \\ V_3 &= 6 \text{ V} & I_3 &= 2 \text{ A} \\ V_4 &= 12 \text{ V} & I_4 &= 4 \text{ A} \\ P_{G1} &= 36 \text{ W}, P_{G4} = 72 \text{ W}, P_{G5} = 12 \text{ W} \end{aligned}$$


---

**Esercizio n. 44**

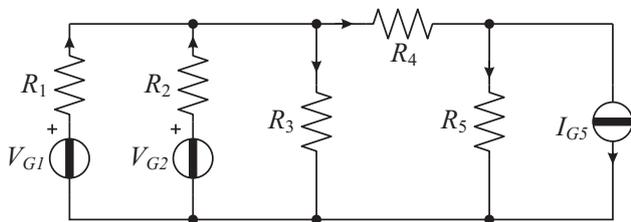
$$\begin{aligned} R_1 &= 2 \Omega \\ R_2 &= 4 \Omega \\ R_3 &= 4 \Omega \\ R_4 &= 4 \Omega \\ R_5 &= 3 \Omega \\ V_{G1} &= 18 \text{ V} \\ V_{G5} &= 16 \text{ V} \end{aligned}$$

Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= 10 \text{ V} & I_1 &= 5 \text{ A} \\ V_2 &= 8 \text{ V} & I_2 &= 2 \text{ A} \\ V_3 &= 12 \text{ V} & I_3 &= 3 \text{ A} \\ V_4 &= -4 \text{ V} & I_4 &= -1 \text{ A} \\ V_5 &= 12 \text{ V} & I_5 &= 4 \text{ A} \\ P_{G1} &= 90 \text{ W} & P_{G5} &= 64 \text{ W} \end{aligned}$$


---

**Esercizio n. 45**

$$\begin{aligned} R_1 &= 4 \Omega \\ R_2 &= 6 \Omega \\ R_3 &= 12 \Omega \\ R_4 &= 2 \Omega \\ R_5 &= 4 \Omega \\ V_{G1} &= 8 \text{ V} \\ V_{G2} &= 12 \text{ V} \\ I_{G5} &= 3 \text{ A} \end{aligned}$$

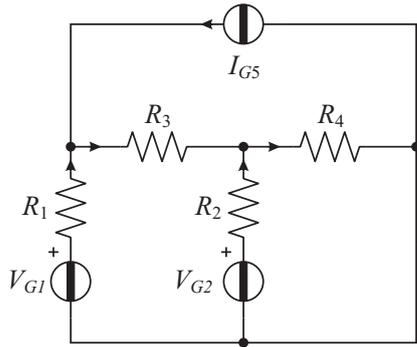
Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$$\begin{aligned} V_1 &= 5 \text{ V} & I_1 &= 1.25 \text{ A} \\ V_2 &= 9 \text{ V} & I_2 &= 1.5 \text{ A} \\ V_3 &= 3 \text{ V} & I_3 &= 0.25 \text{ A} \\ V_4 &= 5 \text{ V} & I_4 &= 2.5 \text{ A} \\ V_5 &= -2 \text{ V} & I_5 &= -0.5 \text{ A} \\ P_{G1} &= 10 \text{ W}, P_{G2} = 18 \text{ W}, P_{G5} = 6 \text{ W} \end{aligned}$$


---

**Esercizio n. 46**



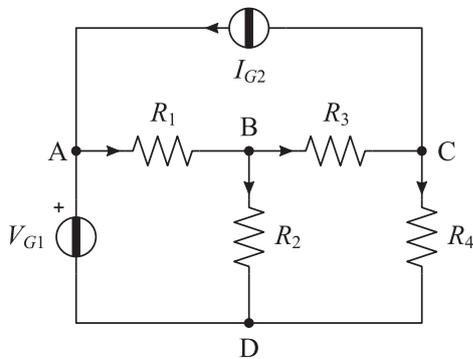
- $R_1 = 4 \Omega$
- $R_2 = 6 \Omega$
- $R_3 = 2 \Omega$
- $R_4 = 3 \Omega$
- $V_{G1} = 12 \text{ V}$
- $V_{G2} = 24 \text{ V}$
- $I_{G5} = 3 \text{ A}$

Determinare le correnti dei resistori.

**Risultati**

$I_1 = -1 \text{ A}$ ,  $I_2 = 2 \text{ A}$ ,  $I_3 = 2 \text{ A}$ ,  $I_4 = 4 \text{ A}$

**Esercizio n. 47**



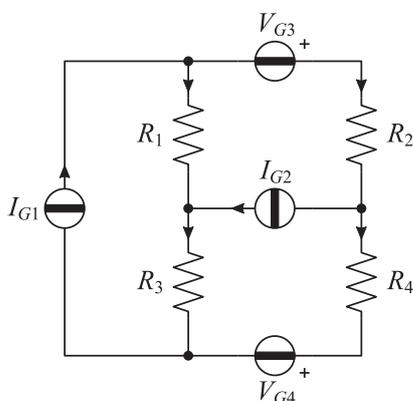
- $R_1 = 6 \Omega$
- $R_2 = 6 \Omega$
- $R_3 = 6 \Omega$
- $R_4 = 6 \Omega$
- $V_{G1} = 30 \text{ V}$
- $I_{G2} = 5 \text{ A}$

Determinare le tensioni e le correnti dei resistori e le potenze erogate dai generatori.

**Risultati**

$V_1 = 24 \text{ V}$	$I_1 = 4 \text{ A}$
$V_2 = 6 \text{ V}$	$I_2 = 1 \text{ A}$
$V_3 = 18 \text{ V}$	$I_3 = 3 \text{ A}$
$V_4 = -12 \text{ V}$	$I_4 = -2 \text{ A}$
$P_{G1} = -30 \text{ W}$	$P_{G2} = 210 \text{ W}$

**Esercizio n. 48**

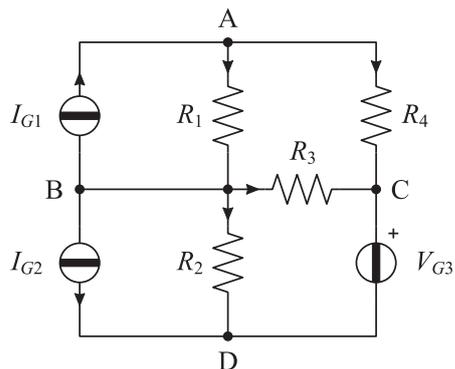


- $R_1 = 2 \Omega$
- $R_2 = 4 \Omega$
- $R_3 = 4 \Omega$
- $R_4 = 2 \Omega$
- $I_{G1} = 1 \text{ A}$
- $I_{G2} = 2 \text{ A}$
- $V_{G3} = 12 \text{ V}$
- $V_{G4} = 6 \text{ V}$

Determinare le potenze erogate dai generatori.

**Risultati**

$P_{G1} = 2 \text{ W}$ ,  $P_{G2} = -4 \text{ W}$ ,  $P_{G3} = 24 \text{ W}$ ,  $P_{G4} = 0 \text{ W}$

**Esercizio n. 49**

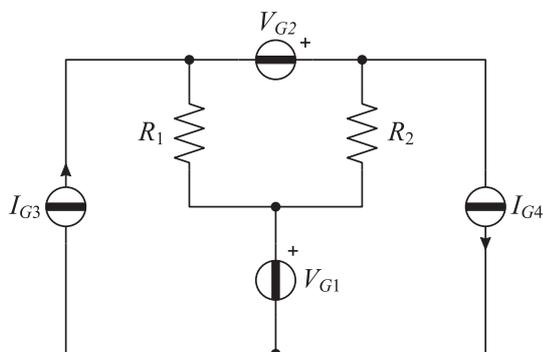
$$\begin{aligned} R_1 &= 2 \, \Omega \\ R_2 &= 6 \, \Omega \\ R_3 &= 3 \, \Omega \\ R_4 &= 4 \, \Omega \\ I_{G1} &= 4 \, \text{A} \\ I_{G2} &= 2 \, \text{A} \\ V_{G3} &= 24 \, \text{V} \end{aligned}$$

Determinare le tensioni dei resistori.

**Risultati**

$$V_1 = 9 \, \text{V}, V_2 = 13 \, \text{V}, V_3 = -11 \, \text{V}, V_4 = -2 \, \text{V}$$


---

**Esercizio n. 50**

$$\begin{aligned} R_1 &= 4 \, \Omega \\ R_2 &= 4 \, \Omega \\ V_{G1} &= 12 \, \text{V} \\ V_{G2} &= 16 \, \text{V} \\ I_{G3} &= 3 \, \text{A} \\ I_{G4} &= 1 \, \text{A} \end{aligned}$$

Determinare le potenze erogate dai generatori.

**Risultati**

$$P_{G1} = -24 \, \text{W}, P_{G2} = 64 \, \text{W}, P_{G3} = 24 \, \text{W}, P_{G4} = -24 \, \text{W}$$


---