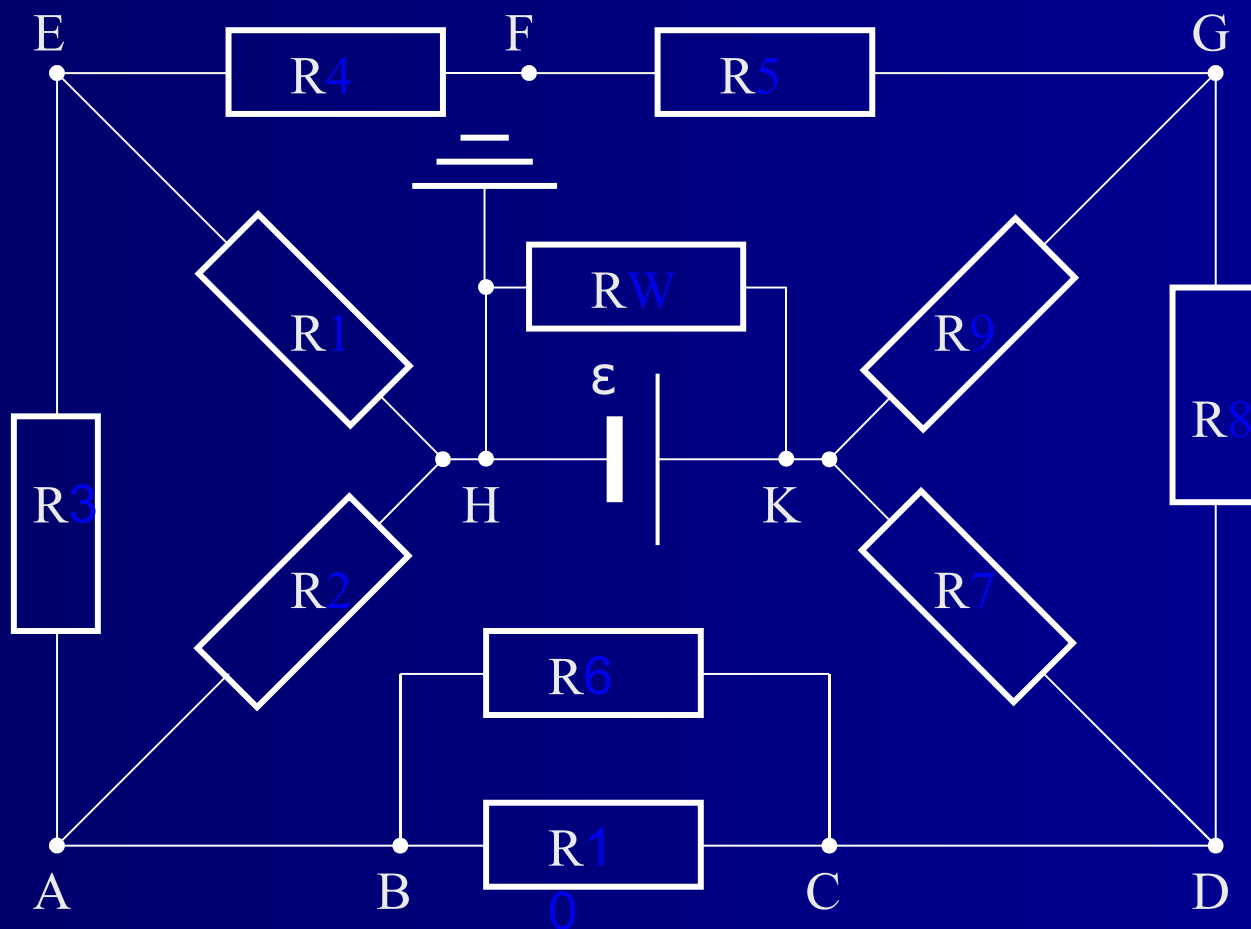


Ćwiczenie 12

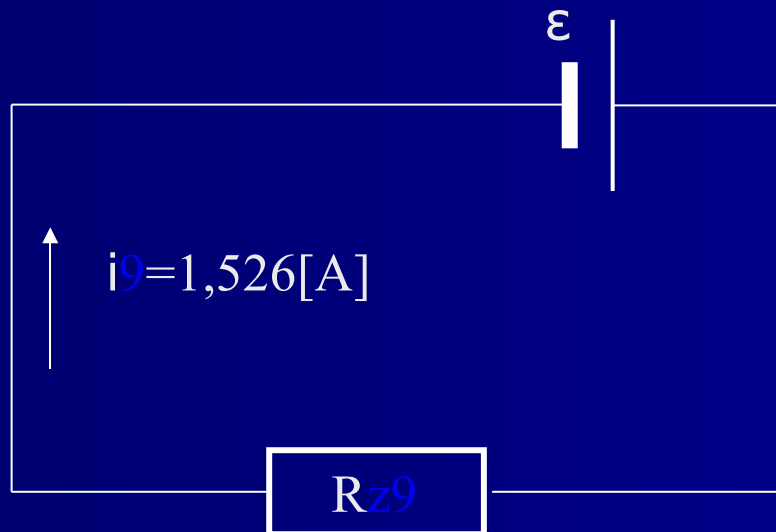


Ćwiczenie 12

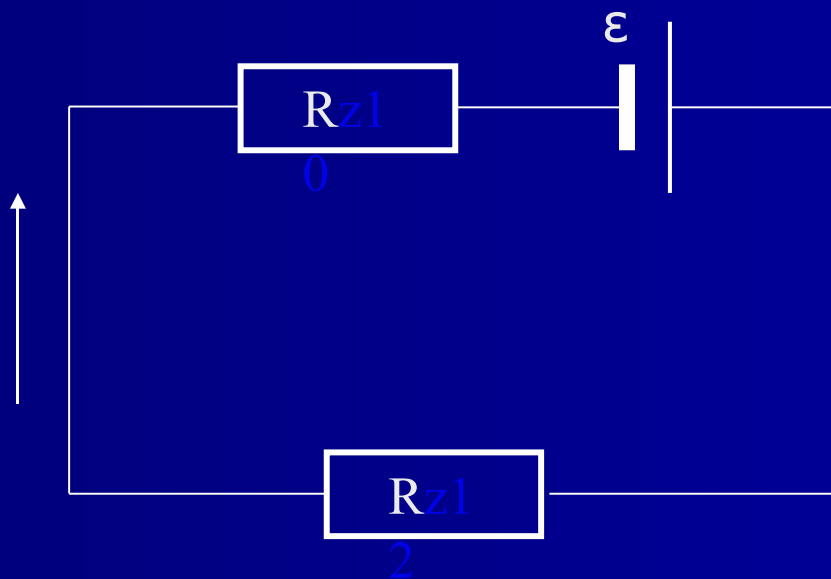
Oblicz potencjał względem masy punktów:
A, B, C, D, E, F, G, H, K

Oblicz różnicę potencjałów między
punktami: AF, BG, DE

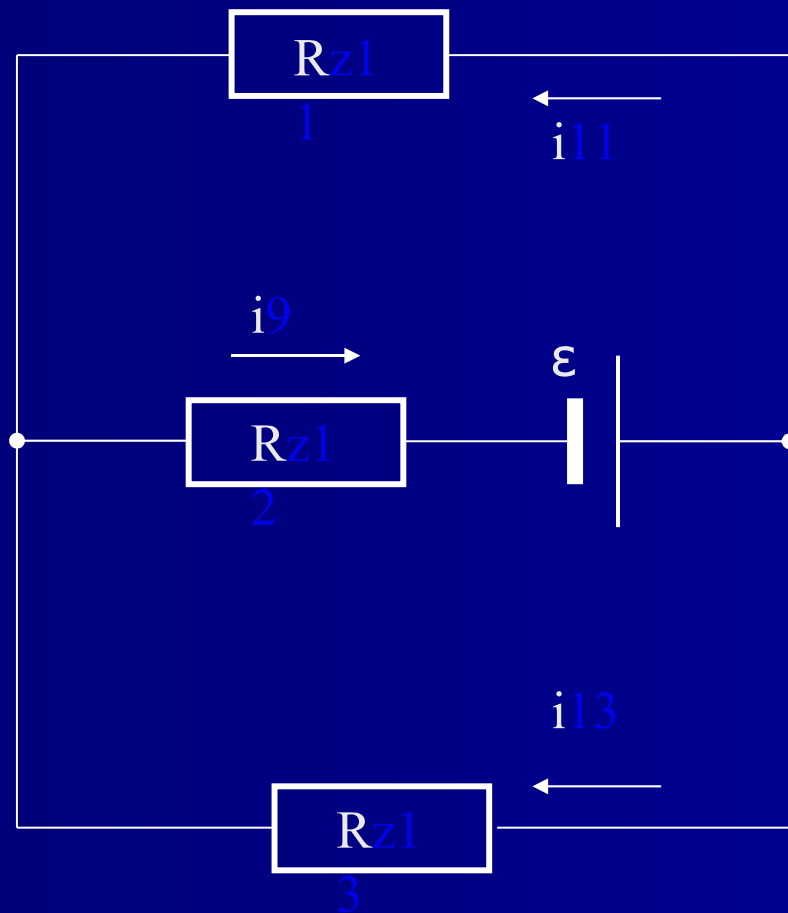
Ćwiczenie 12



Ćwiczenie 12



Ćwiczenie 12



Ćwiczenie 12

$$i_9 = i_{11} + i_{13} \quad i_{11} = i_9 - i_{13}$$

$$i_{11} \cdot R_{z11} = i_{13} \cdot R_{z13}$$

$$i_9 \cdot R_{z11} - i_{13} \cdot R_{z11} = i_{13} \cdot R_{z13}$$

$$i_{13} \cdot (R_{z11} + R_{z13}) = i_9 \cdot R_{z11}$$

$$i_{13} = i_9 \cdot \frac{R_{z11}}{R_{z11} + R_{z13}}$$

Ćwiczenie 12

$$i_{13} = i_9 \cdot \frac{R_{z11}}{R_{z11} + R_{z13}}$$

$$i_{13} = 1,526[A] \cdot \frac{23,51[\Omega]}{23,51[\Omega] + 10,42[\Omega]}$$

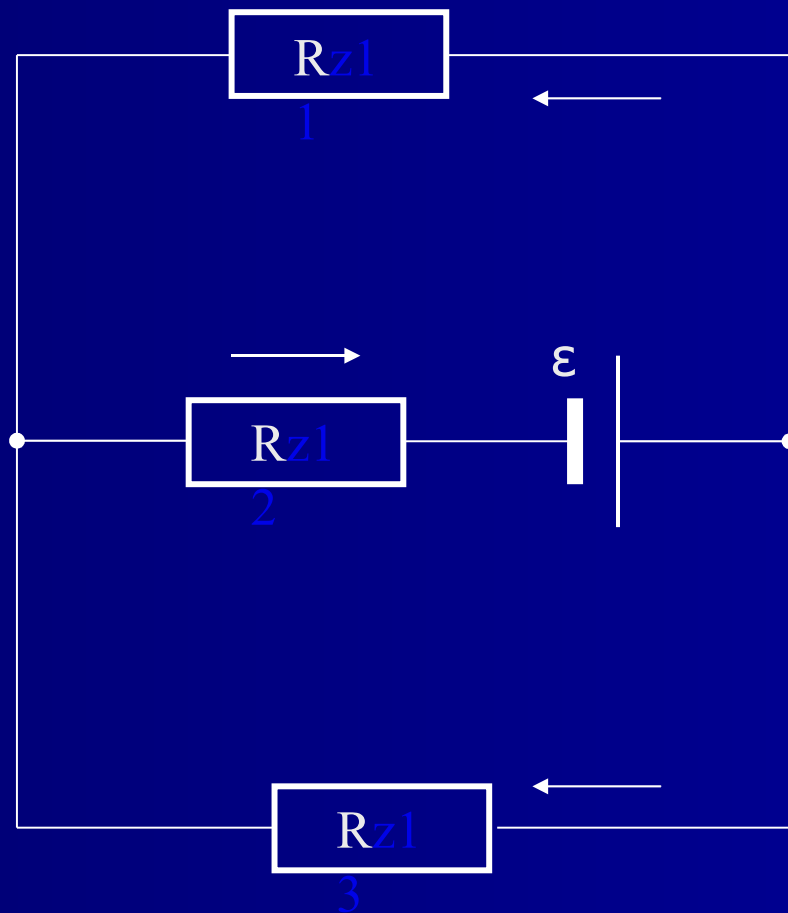
$$i_{13} = 1,057[A]$$

$$i_{11} = i_9 - i_{13}$$

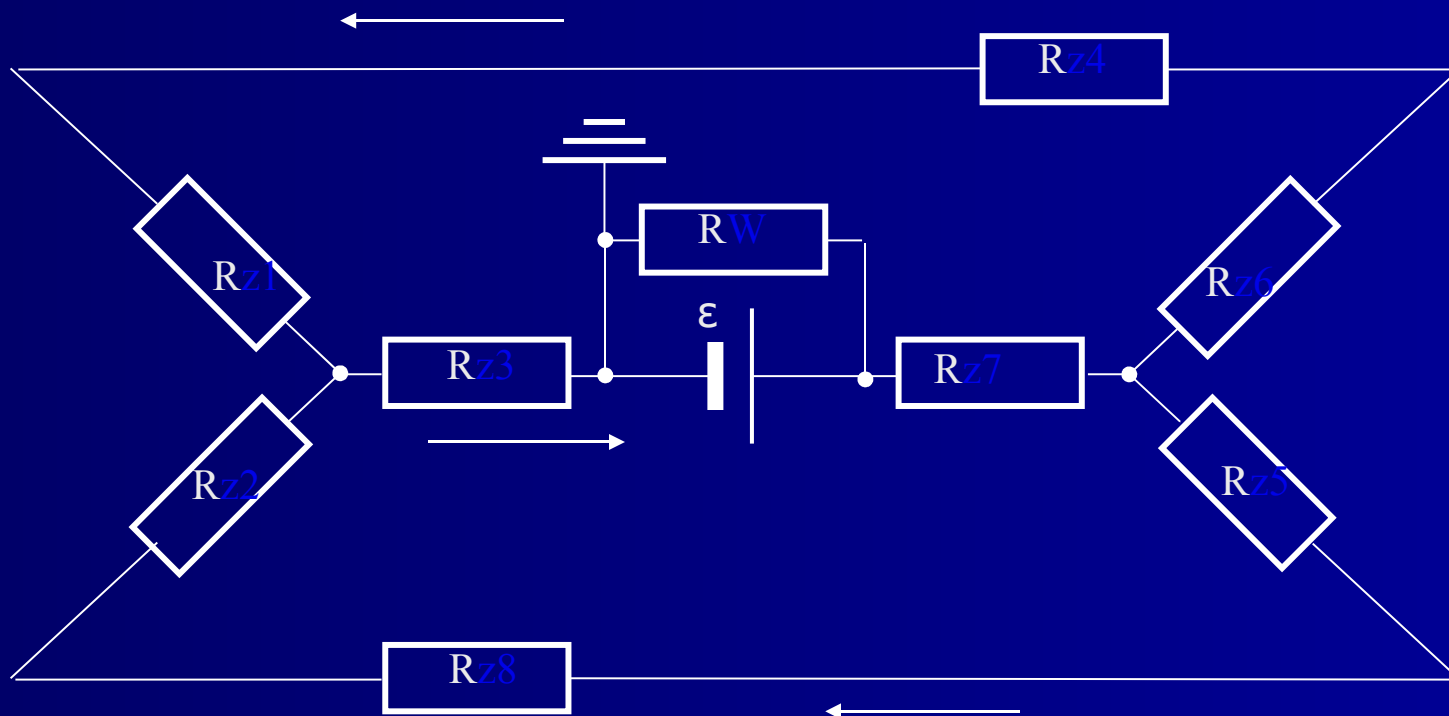
$$i_{11} = 1,526[A] - 1,057[A]$$

$$i_{11} = 0,469[A]$$

Ćwiczenie 12



Ćwiczenie 12



Ćwiczenie 12

$$U_{z2} = i_{13} \cdot R_{z2} = 1,057[A] \cdot 0,92[\Omega]$$

$$U_{z2} = 0,97[V]$$

$$U_{z3} = i_9 \cdot R_{z3} = 1,526[A] \cdot 1,38[\Omega]$$

$$U_{z3} = 2,11[V]$$

$$U_{z1} = i_{11} \cdot R_{z1} = 0,469[A] \cdot 1,85[\Omega]$$

$$U_{z1} = 0,87[V]$$

Ćwiczenie 12

$$U_{z5} = i_{13} \cdot R_{z5} = 1,057[A] \cdot 5,0[\Omega]$$

$$U_{z5} = 5,29[V]$$

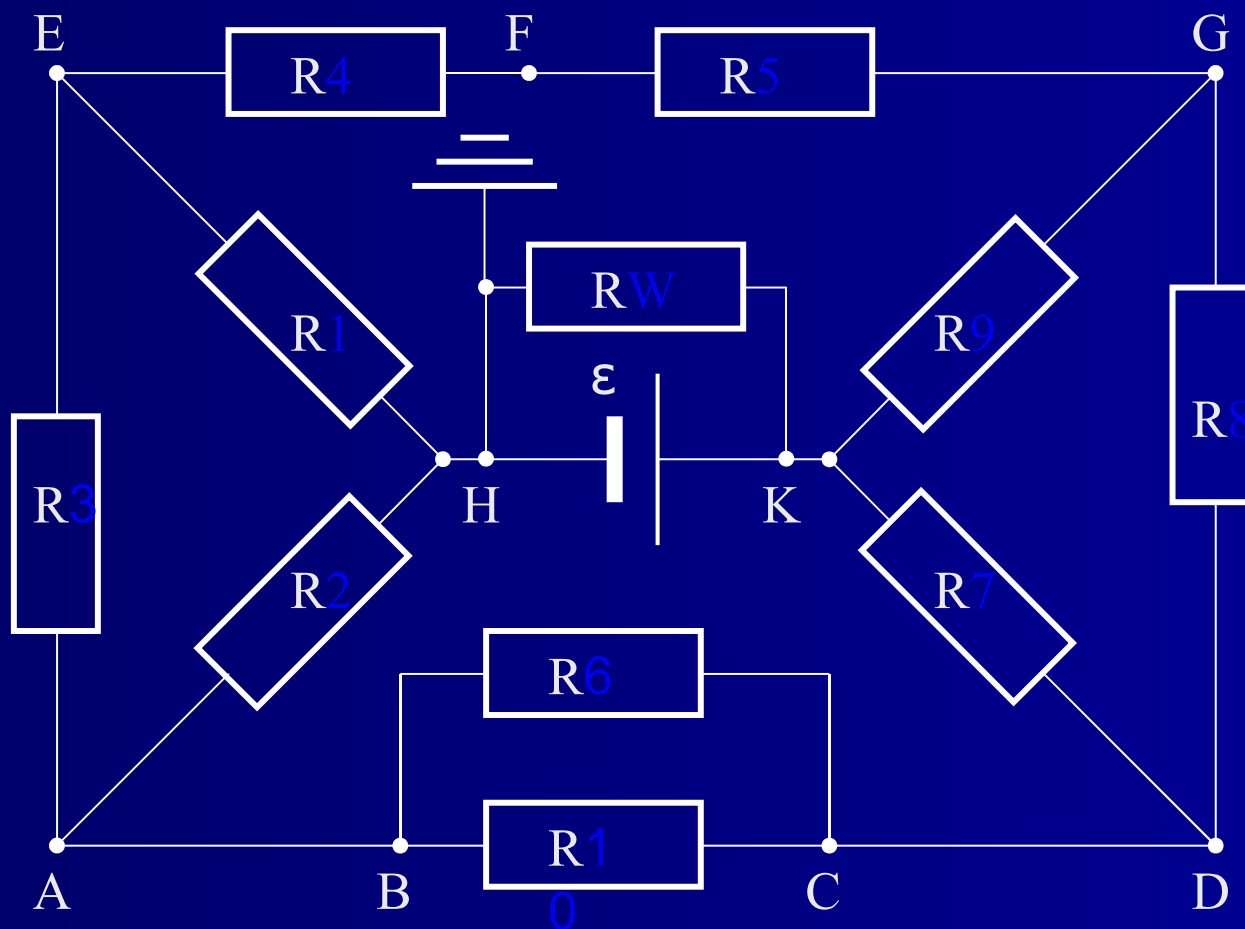
$$U_{z6} = i_{11} \cdot R_{z6} = 0,469[A] \cdot 1,67[\Omega]$$

$$U_{z6} = 0,78[V]$$

$$U_{z7} = i_9 \cdot R_{z7} = 1,526[A] \cdot 2,5[\Omega]$$

$$U_{z7} = 3,82[V]$$

Ćwiczenie 12



Ćwiczenie 12

$$U_{EH} = U_{z1} + U_{z3} = 0,87[V] + 2,11[V]$$

$$U_{EH} = 2,98[V]$$

$$U_{AH} = U_{z3} + U_{z2} = 2,11[V] + 0,97[V]$$

$$U_{AH} = 3,08[V]$$

$$U_{EA} = U_{z2} - U_{z1} = 0,97[V] - 0,87[V]$$

$$U_{EA} = 0,1[V]$$

Ćwiczenie 12

$$U_{KG} = U_{z7} + U_{z6} = 3,82[V] + 0,78[V]$$

$$U_{KG} = 4,6[V]$$

$$U_{KD} = U_{z7} + U_{z5} = 3,82[V] + 5,29[V]$$

$$U_{KD} = 9,1[V]$$

$$U_{GD} = U_{z6} - U_{z5} = 0,78[V] - 5,29[V]$$

$$U_{GD} = -4,51[V]$$

Ćwiczenie 12

$$U_{HK} = \varepsilon - i_9 \cdot R_W$$

$$U_{HK} = 20[V] - 1,526[A] \cdot 2[\Omega]$$

$$U_{HK} = 16,95[V]$$

$$U_H = 0$$

$$U_K = 16,95[V]$$

Ćwiczenie 12

$$U_G = U_K - U_{KG}$$

$$U_G = 16,95[V] - 4,6[V]$$

$$U_G = 12,35[V]$$

$$U_F = U_G - i_{11} \cdot R_5$$

$$U_F = 12,35[V] - 0,469[A] \cdot 12[\Omega]$$

$$U_F = 6,72[V]$$

Ćwiczenie 12

$$U_E = U_F - i_{11} \cdot R_4$$

$$U_E = 6,72[V] - 0,469[A] \cdot 8[\Omega]$$

$$U_E = 2,98[V]$$

$$U_H = U_E - U_{EH}$$

$$U_H = 2,98[V] - 2,98[V]$$

$$U_H = 0$$

Ćwiczenie 12

$$U_D = U_K - U_{KD}$$

$$U_D = 16,95[V] - 9,1[V]$$

$$U_D = 7,85[V]$$

$$U_C = U_D = 7,85[V]$$

$$U_B = U_C - i_{13} \cdot R_{z8}$$

$$U_B = 7,85[V] - 1,057[A] \cdot 4,5[\Omega]$$

$$U_B = 3,08[V]$$

Ćwiczenie 12

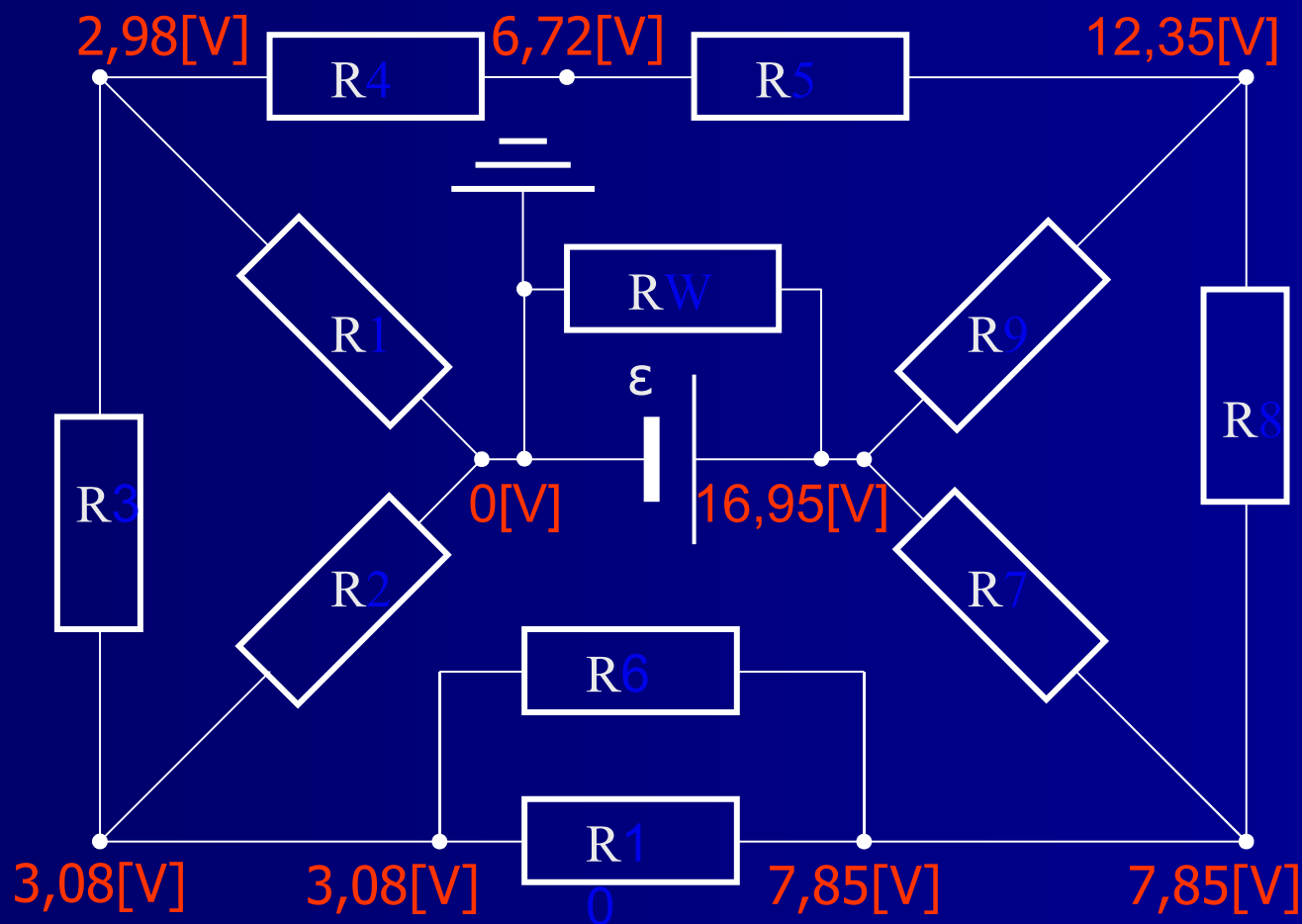
$$U_A = U_B = 3,08[V]$$

$$U_H = U_A - U_{AH}$$

$$U_H = 3,08[V] - 3,08[V]$$

$$U_H = 0$$

Ćwiczenie 12



Ćwiczenie 12

$$U_{AF} = U_F - U_A = 6,72[V] - 3,08[V]$$

$$U_{AF} = 3,64[V]$$

$$U_{BG} = U_G - U_B = 12,35[V] - 3,08[V]$$

$$U_{BG} = 9,27[V]$$

$$U_{DE} = U_E - U_D = 2,98[V] - 7,85[V]$$

$$U_{DE} = -4,87[V]$$