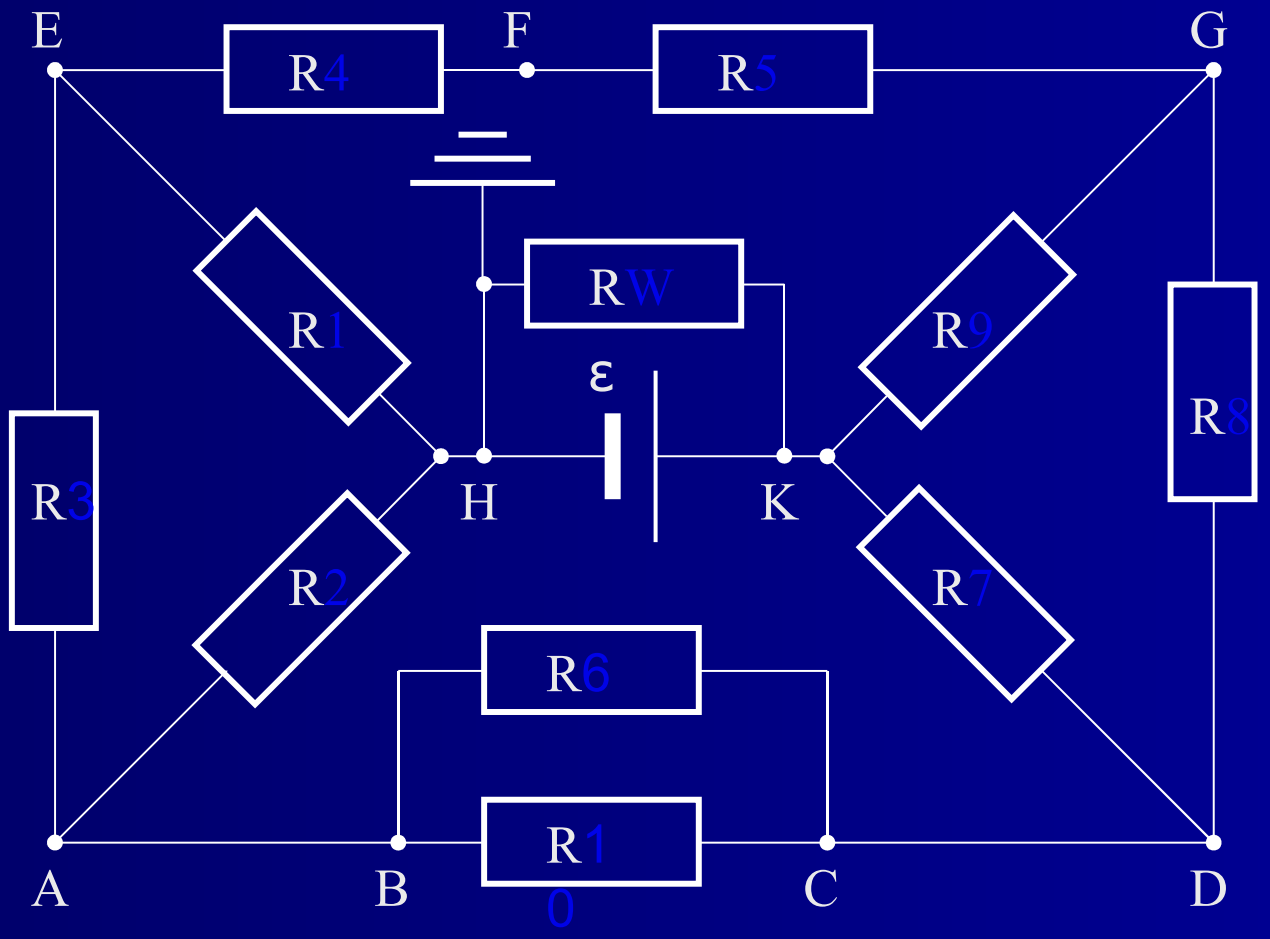
# Ćwiczenie 11





# Ćwiczenie 11



Dane obwodu:

| | | |
|---|---|---|
| $R_1 = 6\ [\Omega]$ | $R_2 = 3\ [\Omega]$ | $R_3 = 4\ [\Omega]$ |
| $R_4 = 8\ [\Omega]$ | $R_5 = 12\ [\Omega]$ | $R_6 = 9\ [\Omega]$ |
| $R_7 = 15\ [\Omega]$ | $R_8 = 10\ [\Omega]$ | $R_9 = 5\ [\Omega]$ |
| $R_{10} = 9\ [\Omega]$ | $R_W = 2\ [\Omega]$ | $\varepsilon = 20\ [V]$ |

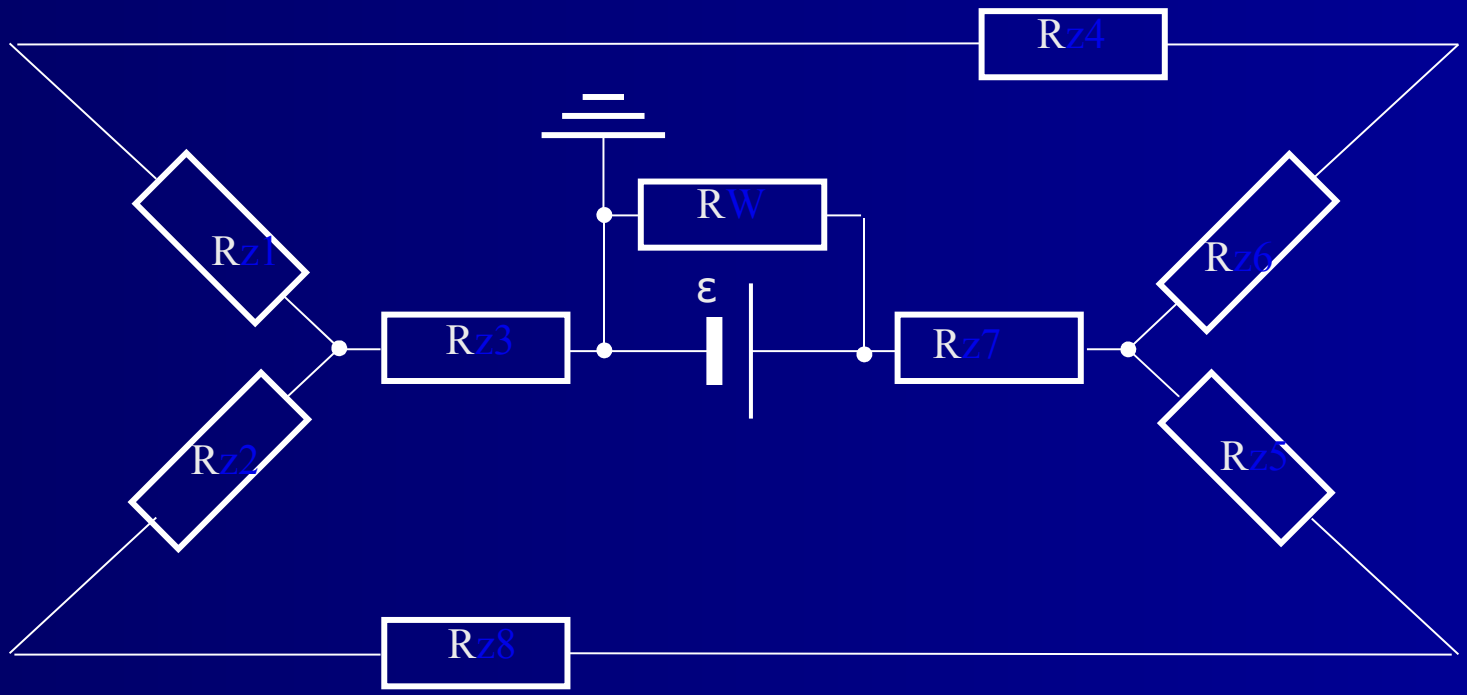
# Ćwiczenie 11

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

Oblicz różnicę potencjałów między punktami: AF,  BG, DE

# Ćwiczenie 11





# Ćwiczenie 11



$$R_{z1} = \frac{R_1 \bullet R_3}{R_1 + R_2 + R_3} = \frac{6[\Omega] \bullet 4[\Omega]}{6[\Omega] + 3[\Omega] + 4[\Omega]} = 1{,}85[\Omega]$$

$$R_{z2} = \frac{R_3 \bullet R_2}{R_1 + R_2 + R_3} = \frac{4[\Omega] \bullet 3[\Omega]}{6[\Omega] + 3[\Omega] + 4[\Omega]} = 0{,}92[\Omega]$$

$$R_{z3} = \frac{R_2 \bullet R_1}{R_1 + R_2 + R_3} = \frac{3[\Omega] \bullet 6[\Omega]}{6[\Omega] + 3[\Omega] + 4[\Omega]} = 1{,}38[\Omega]$$

# Ćwiczenie 11



$$R_{z5} = \frac{R_7 \bullet R_8}{R_7 + R_8 + R_9} = \frac{15[\Omega] \bullet 10[\Omega]}{15[\Omega] + 10[\Omega] + 5[\Omega]} = 5{,}0[\Omega]$$

$$R_{z6} = \frac{R_8 \bullet R_9}{R_7 + R_8 + R_9} = \frac{10[\Omega] \bullet 5[\Omega]}{15[\Omega] + 10[\Omega] + 5[\Omega]} = 1{,}67[\Omega]$$

$$R_{z7} = \frac{R_9 \bullet R_7}{R_7 + R_8 + R_9} = \frac{5[\Omega] \bullet 15[\Omega]}{15[\Omega] + 10[\Omega] + 5[\Omega]} = 2{,}5[\Omega]$$

# Ćwiczenie 11



$$R_{z4} = R_4 + R_5 = 8[\Omega] + 12[\Omega] = 20[\Omega]$$

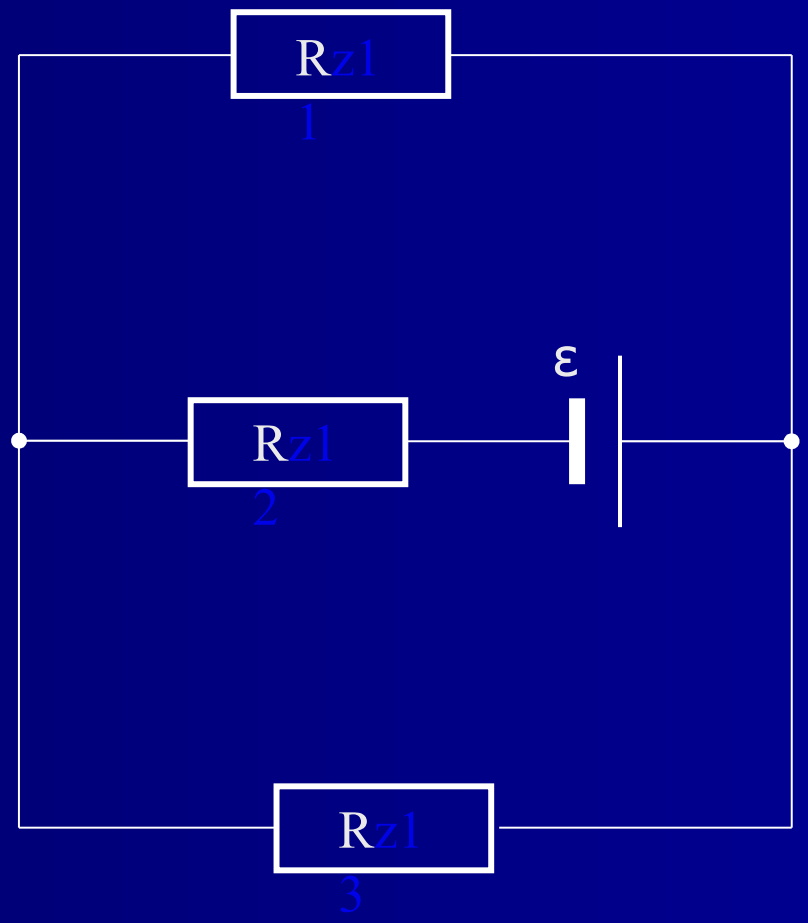
$$\frac{1}{R_{z8}} = \frac{1}{R_6} + \frac{1}{R_{10}}$$

$$R_{z8} = \frac{R_6 \cdot R_{10}}{R_6 + R_{10}}$$

$$R_{z8} = \frac{9[\Omega] \cdot 9[\Omega]}{9[\Omega] + 9[\Omega]} = 4{,}5[\Omega]$$

# Ćwiczenie 11





# Ćwiczenie 11



$$R_{z11} = R_{z1} + R_{z4} + R_{z6} = 1{,}85[\Omega] + 20[\Omega] + 1{,}67[\Omega]$$

$$R_{z11} = 23{,}51[\Omega]$$

$$R_{z12} = R_{z3} + R_W + R_{z7} = 1{,}38[\Omega] + 2[\Omega] + 2{,}5[\Omega]$$

$$R_{z12} = 5{,}88[\Omega]$$

$$R_{z13} = R_{z2} + R_{z8} + R_{z5} = 0{,}92[\Omega] + 4{,}5[\Omega] + 5[\Omega]$$

$$R_{z13} = 10{,}24[\Omega]$$

# Ćwiczenie 11

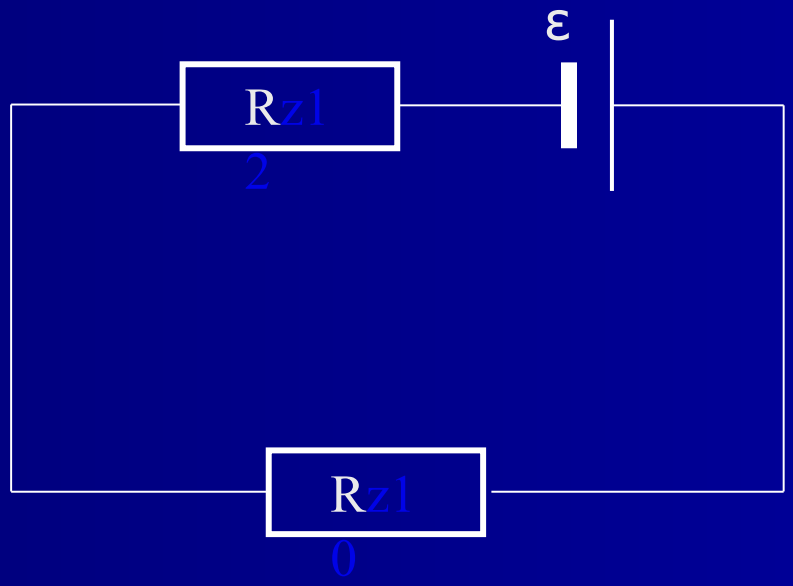


$$\frac{1}{R_{z10}} = \frac{1}{R_{z11}} + \frac{1}{R_{z13}}$$

$$R_{z10} = \frac{R_{z11} \cdot R_{z13}}{R_{z11} + R_{z13}}$$

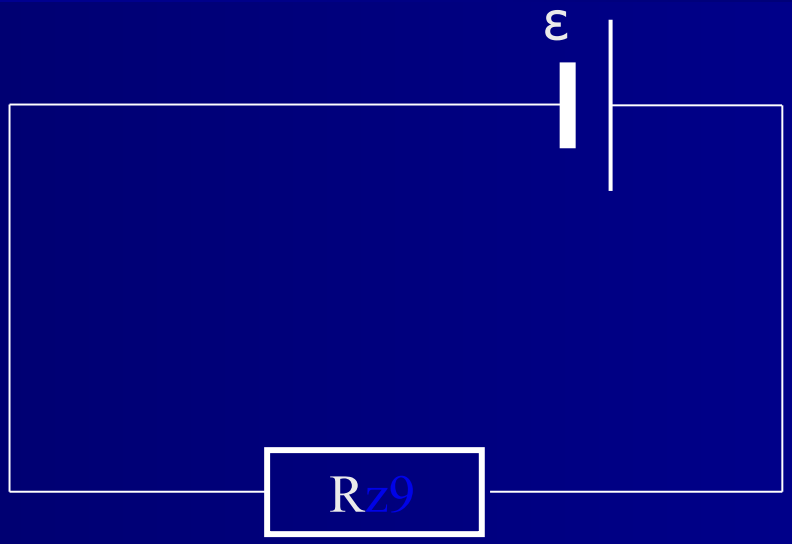
$$R_{z10} = \frac{23{,}51[\Omega] \cdot 10{,}42[\Omega]}{23{,}51[\Omega] + 10{,}42[\Omega]}$$

$$R_{z10} = 7{,}22[\Omega]$$



# Ćwiczenie 11






$$R_{z9} = R_{z12} + R_{z10} = 5{,}88[\Omega] + 7{,}22[\Omega] =$$

$$R_{z9} = 13{,}1[\Omega]$$

$$i_9 = \frac{\varepsilon}{R_{z9}} = \frac{20[V]}{13{,}1[\Omega]} = 1{,}526[A]$$

# Ćwiczenie 11