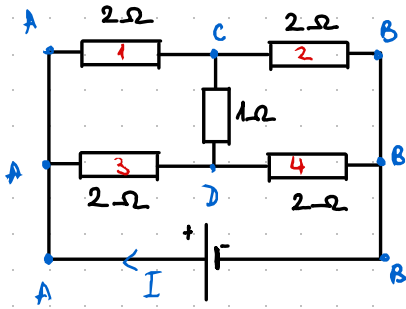


6. MOST, ZVIJEZDA, TROKUT



→ nema paralele

→ ali nema ni serije

→ TO JE MOSTNI SPOJ

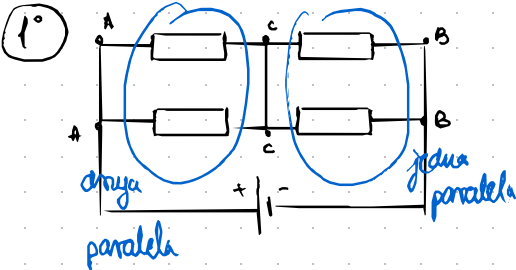
ONO ŠTO VRIJEDI:

$$R_1 \cdot R_4 = R_2 \cdot R_3$$

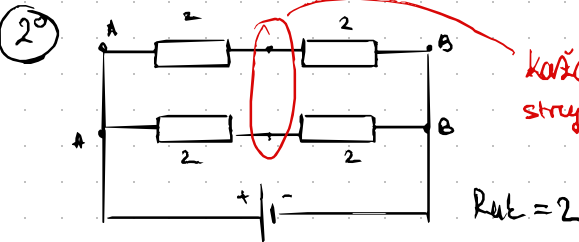
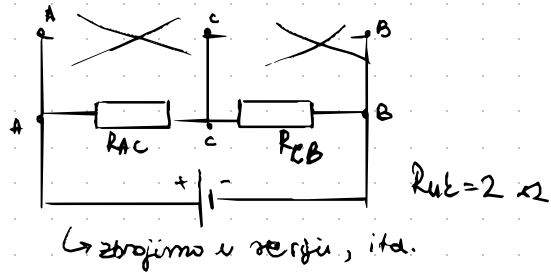
→ most je u ravnoteži

MOST U RAVNOTEŽI $\Rightarrow Q_C = Q_D$ - nema razlike u potencijalu na srednjem otporniku
 \Rightarrow ne prolazi struja

→ shemu možemo TRANSFORMIRATI



\Rightarrow



kažemo da je srednji $R = \infty$, i ne prolazi struja → nema tog dijela uopće

\Rightarrow 1.) prepoznati most

2) je li u ravnoteži

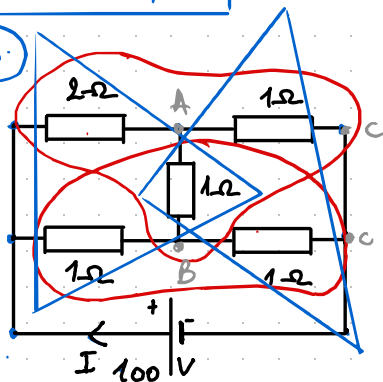
3) ako je - skicirati na jedan od dva načina

W12 18/19.

KADA MOST

NJE U RAVNOTEŽI

19.



MOSNI SPOJ NJE U RAVNOTEŽI

⇒ iz trokuta u zvijezdu
i iz zvijezde u trokut



★ - zvijezdište - točka potencijala u kojoj se grana 3 otpornika

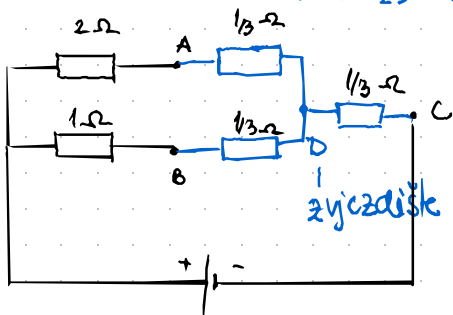
Δ - imamo 3 točke potencijala

- između svake 2 točke je spojen 1 otpornik

→ transformiramo jedan Δ → u ★

· biramo simetrični trokut → sim. ★ ima $\frac{R}{3}$ (input manji otpor)

FORMULA: $R_1 = \frac{R_{12} \cdot R_{13}}{R_{12} + R_{23} + R_{31}}$



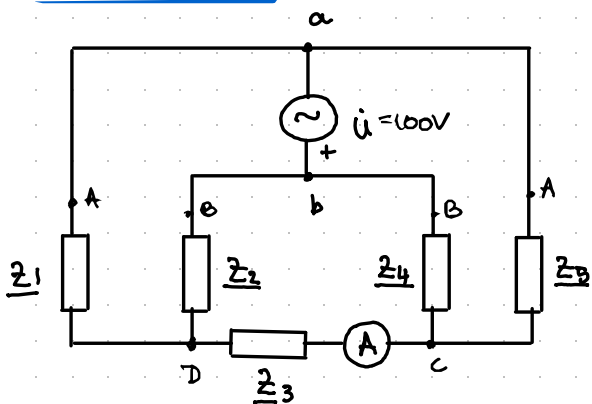
$$R_y = \frac{R_{AB} \cdot R_{AC}}{R_{AB} + R_{BC} + R_{CA}}$$

$$R_y = \frac{1}{3} \Omega$$

$$R_{uk} = \left(2 + \frac{1}{3} + \frac{1}{1/3} \right)^{-1} + \frac{1}{3} = \frac{13}{11} \Omega$$

$$I = \frac{U}{R_{uk}} = \frac{100 \cdot 11}{13} A = 84,6 A$$

M1 18/19.



$$Z_1 = j2\Omega$$

$$Z_2 = 2 + j2\Omega$$

$$Z_3 = j4\Omega$$

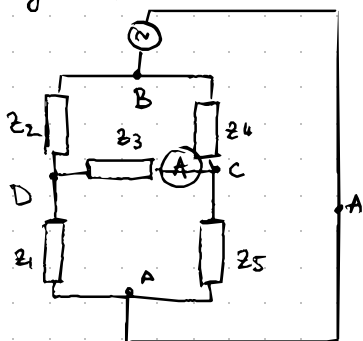
$$Z_4 = 3\Omega$$

$$Z_5 = 1.5 + 1.5j\Omega$$

$$u = 100 \angle 0^\circ \text{ V}$$

$$I_3 = ?$$

→ mogli bi pretvarati $\star \leftrightarrow \Delta$, ali prvo proverimo je li most



$$Z_2 \cdot Z_5 = Z_4 \cdot Z_1$$

$$(2 + j2)(1.5 + 1.5j) = 3(j2)$$

$$6 \angle 90^\circ = 6 \angle 90^\circ \text{ kr most u ravnoteži}$$

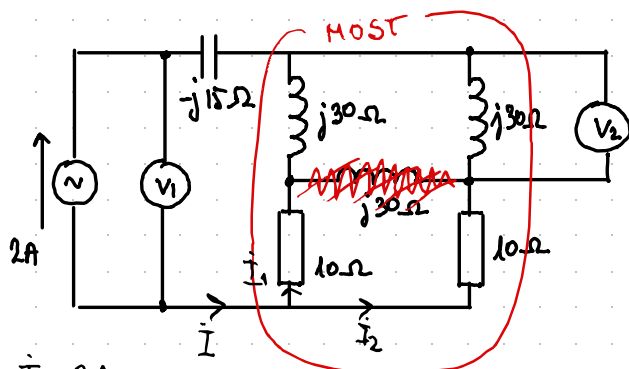
$$\Rightarrow \varphi_D = \varphi_C$$

$$\hookrightarrow \text{nema razlike } \varphi \rightarrow \text{struja je } 0$$

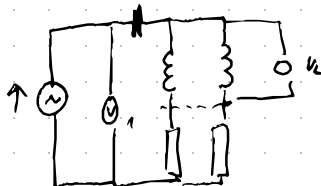
$$\hookrightarrow I_3 = 0 \text{ A}$$

LJIR 20./21.

$$V_2 - V_1 = ?$$



most kr u ravnoteži



$$I = 2 \text{ A}$$

$$Z_{uk} = \frac{U_1}{I} \rightarrow V_1$$

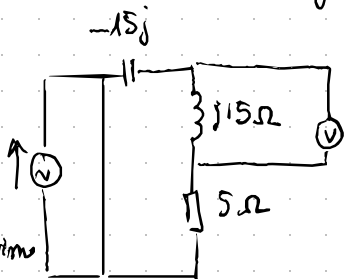
$$I_2 = I_1 = \frac{1}{2} I \text{ (isti su otpori)} \rightarrow I_2 = 1 \text{ A}$$

$$U_2 = I_2 \cdot (jX_L)$$

$$U_2 = I_2 \cdot j30 = \boxed{30 \angle 90^\circ \text{ V}}$$

ne freba

Budući da je paralela između dviju ekvivalentnih grana → prepravimo jednu i to je Z_{uk}



$$Z_{uk} = -15j + j15 + 5\Omega$$

$$Z_{uk} = 5\Omega$$

$$U_1 = Z_{uk} \cdot I = 10 \text{ V}$$

$$V_2 - V_1 = 20 \text{ V}$$

JIR 18./19.

10.

$R_i = ?$ max snaga na teretu

$$R_i = 90 \Omega$$

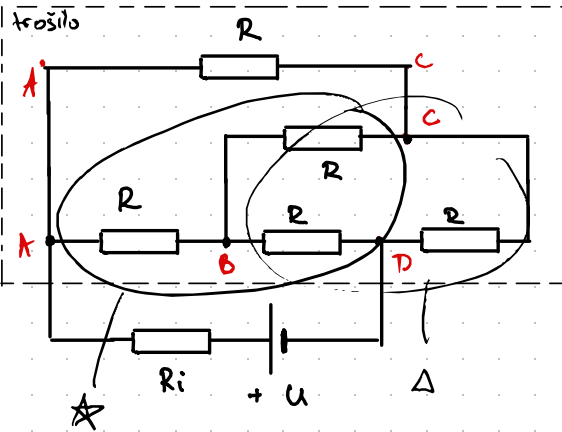
TH Max Snaga

$R_t = R_i$ da bi se na njemu razvijala max snaga

- nema snajla, numa paralela

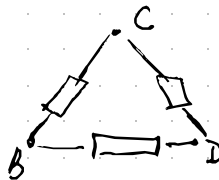
$\Delta \rightarrow \star$ (Y)

znaci trebamo izracunati R_t da bi dobili R_i



$\Delta \rightarrow \star$

$$R_1 = \frac{R_{12} \cdot R_{31}}{R_{12} + R_{23} + R_{31}}$$

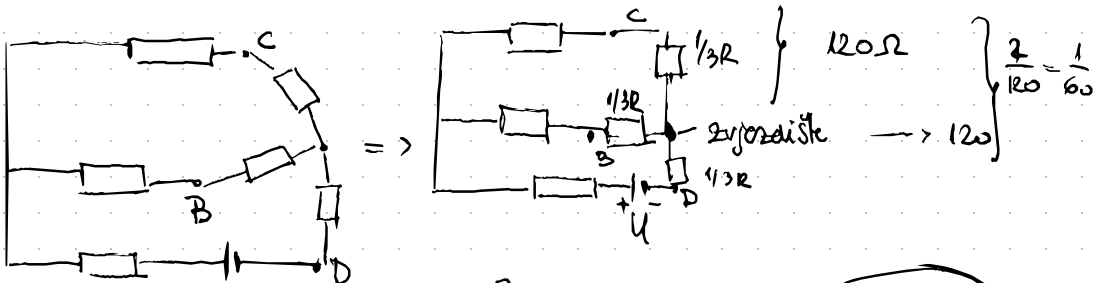


ali buduci da su svi $R_i = 90 \Omega$

$$\rightarrow R_Y \cdot \frac{R^2}{3R} = \frac{1}{3} R$$

smanjiti ce se 3 puta

\rightarrow ostaviti ekvivalentne šeme:



$$R_{uk} = 60 \Omega + 30 \Omega = 90 \Omega$$

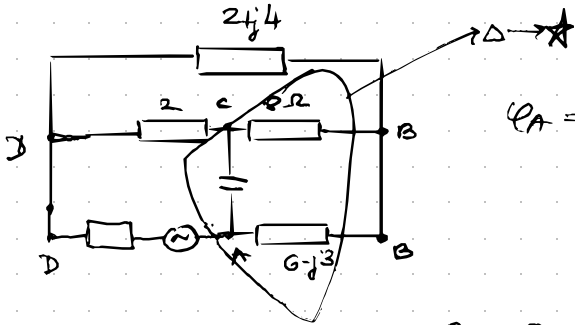
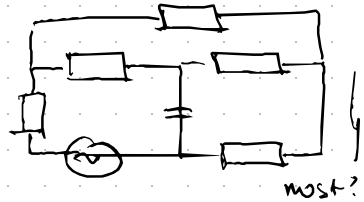
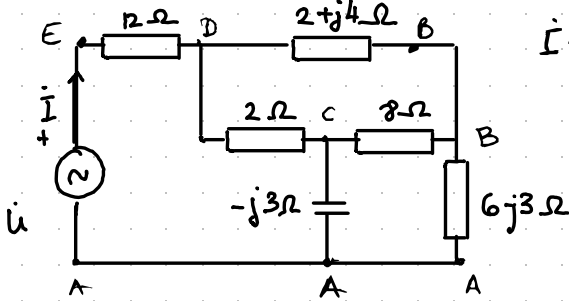
$R_t = 90 \Omega$ TH max snaga $\rightarrow R_i = 90 \Omega$

DOD 19.20.

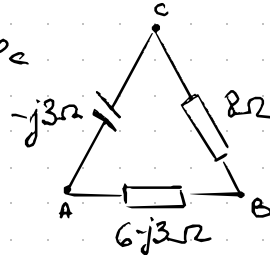
(5.)

$$\dot{u} = 50 \angle 0^\circ \text{ V}$$

$$\dot{I} = ?$$

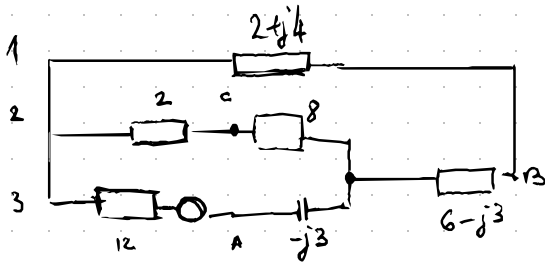


$$R_A = R_c$$



mij u
razmotreži

$$R_Y = \frac{R_{12} \cdot R_{31}}{R_{12} + R_{23} + R_{31}} = \frac{24 \angle 50^\circ}{2\sqrt{58} \angle 23,2^\circ} = 1,576 \angle 113,2^\circ$$



$$\dot{I} = \frac{u}{Z}$$

$$Z_1 = 2 + j4 \quad Z_2 = 16 - j3 = 16,28 \angle -10,62^\circ$$

$$Z_{12} = 4,04 \angle 49,64^\circ$$

$$Z_3 = 12 - j3$$

$$Z_{ul} = \left(\frac{1}{Z_3} + \frac{1}{Z_{12}} \right)^{-1}$$

$$Z_{ul} = 3,42 \angle 35,30^\circ \quad \dot{I} = \underline{50 \angle 0^\circ}$$