

Ηλεκτρικά Κυκλώματα Ι

Διάλεξη 21-23

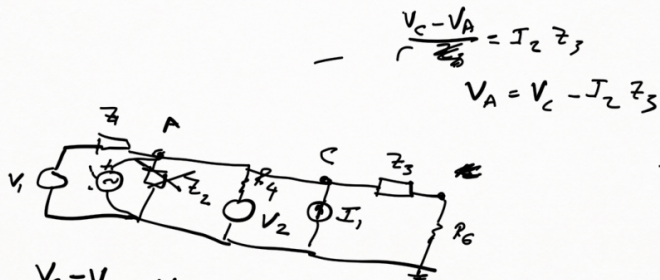
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(10,15,17)-01-2025

1 Ασκήσεις - Απορίες

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Ασκήσεις - Απορίες 1



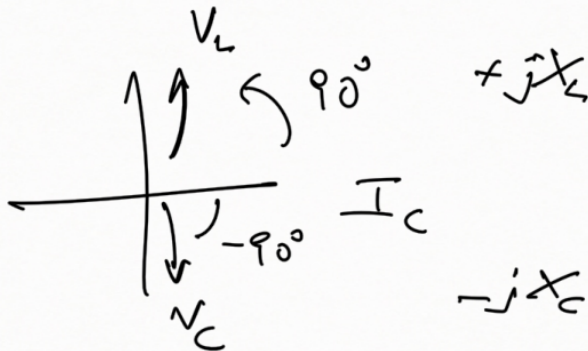
$$\frac{V_C - V_A}{z_2} = I_2 z_3$$

$$V_A = V_C - I_2 z_3$$

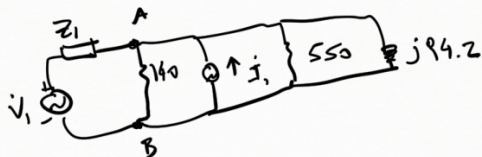
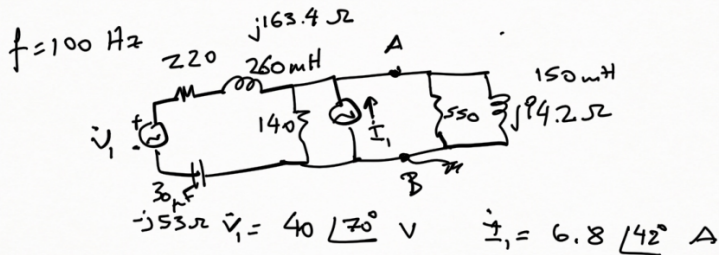
$$\frac{V_C - V_1}{z_1} + \frac{V_C}{z_2} + \frac{V_C - V_2}{R_4} - I_1 + \frac{V_C}{z_3 + R_6} = 0$$

$$V_C = \frac{V_1/z_1 + V_2/R_4 + I_1}{1/z_1 + 1/z_2 + 1/R_4 + 1/(z_3 + R_6)}$$

Ασκήσεις - Απορίες 2



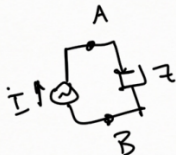
Ασκήσεις - Απορίες 3



$$Z_1 = 220 + j163.4 - j53$$

$$\frac{\dot{V}_A - \dot{V}_1}{Z_1} + \frac{\dot{V}_A}{140} - \dot{I}_1 + \frac{\dot{V}_A}{550} + \frac{\dot{V}_A}{j94.2} = 0$$

Ασκήσεις - Απορίες 4



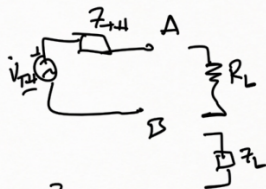
$$\dot{V}_{TH} = \dot{I} \cdot Z$$

$$Z_{TH} = Z$$

$$\dot{I}_N = \dot{I}$$

$$Z = Z_{TH}^*$$

$$P_{max} = \frac{|\dot{V}_{TH}|^2}{4 \operatorname{Re}\{Z_{TH}\}}$$



$$\operatorname{Re}\{ \}$$

$$\operatorname{Im}\{ \}$$

$$\alpha + j\beta = z$$

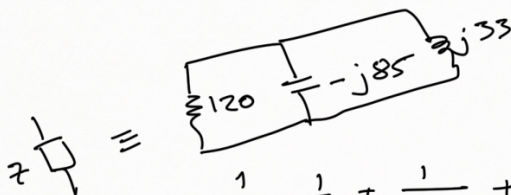
$$\operatorname{Re}\{z\} = \alpha$$

$$\operatorname{Im}\{z\} = \beta$$

$$P_{max} = \frac{|\dot{V}_{TH}|^2}{2 \operatorname{Re}\{Z_{TH}\} + 2|Z_{TH}|}$$

$$R_L = |Z_{TH}|$$

Ασκήσεις - Απορίες 5



$$\frac{1}{z} = \frac{1}{120} + \frac{1}{(-j85)} + \frac{1}{j33} =$$

$$= 8.33 \times 10^{-3} + j11.8 \times 10^{-3} - j30.3 \times 10^{-3} =$$

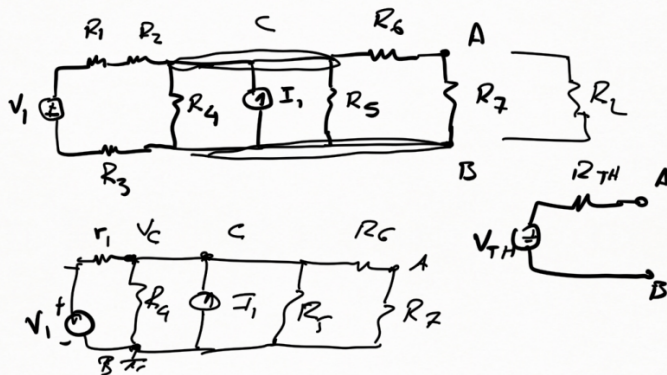
$$= 0.0203 \angle -65.8^\circ$$

$$z = 49.3 \angle 65.8^\circ$$

Ασκήσεις - Απορίες 6

$$\begin{aligned} & \overset{20.8 \angle 75.2^\circ}{(5.3 + j20.1)} \times \overset{7.91 \angle 122.1^\circ}{(-4.2 + j6.7)} \\ &= (20.8 \times 7.91) \angle (75.2 + 122.1)^\circ = 164.5 \angle 197.3^\circ \end{aligned}$$

Ασκήσεις - Απορίες 7



Ασκήσεις - Απορίες 8



$$r = R_4 // R_5 // (R_6 + R_7)$$

