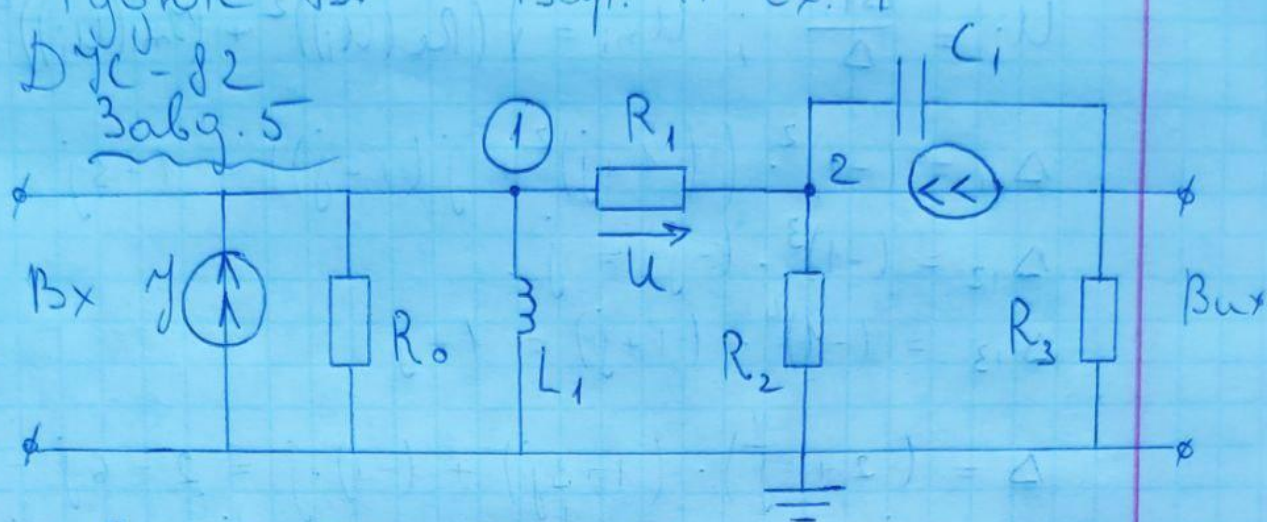


Pygion 12.
Dyc-82
3abg.5

Bap. 11 Cx. 4



$$R_0 = R_1 = R_2 = R_3 = 1$$

$$g = 1; \quad C = 1; \quad L = 1$$

$$y(t) = 1 \cos t \Rightarrow y_m = 1 \cdot e^{j \cdot 0} = 1$$

$$\omega = 1$$

	1	2	3
1	$G_0 + G_1 + \frac{1}{pL}$	$-G_1$	0
2	$-G_1 + g$	$G_1 + G_2 + pC - g$	$-pC$
3	$-g$	$-pC + g$	$pC + G_3$

 $\times \begin{bmatrix} U_1 \\ U_2 \\ U_3 \end{bmatrix} = \begin{bmatrix} y \\ 0 \\ 0 \end{bmatrix}$

Trigemabueaw ($p = j$ i $zuar$ $R; C; L$):

1	$2 + \frac{1}{j}$	-1	0
2	0	$1 + j$	$-j$
3	-1	$1 - j$	$1 + j$

 $\times \begin{bmatrix} U_1 \\ U_2 \\ U_3 \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$

$$\dot{U}_i = \frac{\Delta_{1i}}{\Delta} ; U_{mi} = \sqrt{(\operatorname{Re}(\dot{U}_i))^2 + (\operatorname{Im}(\dot{U}_i))^2}$$

$$\Delta_{11} = (-1)^2 \cdot ((1+j)^2 + j(1-j)) = 1+3j$$

$$\Delta_{12} = (-1)^3 \cdot (-j) = j$$

$$\Delta_{13} = (-1)^4 \cdot (1+j) = 1+j$$

$$\begin{aligned} \Delta &= (2 + \frac{1}{j}) \cdot (1+3j) + (-1) \cdot j = 2 + 6j + \frac{1}{j} + 3 - j = 5 + 5j + \frac{1}{j} = 5 + 5j - j^2 \\ &= 5 + 4j \end{aligned}$$

$$\begin{aligned} 1) \dot{U}_{1m} &= \frac{1+3j}{5+4j} = \frac{(1+3j) \cdot (5-4j)}{(25+16)} = \\ &= \frac{5-4j+15j-12j^2}{41} = \frac{17+11j}{41} = \frac{17}{41} + \frac{11}{41}j \end{aligned}$$

$$2) \dot{U}_{2m} = \frac{j}{5+4j} = \frac{5j-4j^2}{41} = \frac{4}{41} + \frac{5j}{41}$$

$$\begin{aligned} 3) \dot{U}_{3m} &= \frac{1+j}{5+4j} = \frac{(1+j) \cdot (5-4j)}{41} = \frac{5-4j+5j-4j^2}{41} = \\ &= \frac{9+j}{41} = \frac{9}{41} + \frac{j}{41} \end{aligned}$$

$$c) U_{sm} = \frac{5+j}{41} = \frac{5}{41} + \frac{j}{41} = \frac{5}{41} + \frac{j}{41}$$

$$U_{m1} = \sqrt{\frac{289}{1681} + \frac{121}{1681}} = \sqrt{\frac{10}{41}} \approx 0,494$$

$$U_{m2} = \sqrt{\frac{16}{1681} + \frac{25}{1681}} = \sqrt{\frac{1}{41}} \approx 0,156$$

$$U_{m3} = \sqrt{\frac{81}{1681} + \frac{1}{1681}} = \sqrt{\frac{2}{41}} \approx 0,221$$

$$\varphi_{u1} = \arctg\left(\frac{11}{41} \cdot \frac{41}{17}\right) = \arctg\left(\frac{11}{17}\right) =$$

$$= 32,91^\circ$$

$$\varphi_{u2} = \arctg\left(\frac{5}{41} \cdot \frac{41}{5}\right) = \arctg\left(\frac{5}{5}\right) =$$

$$= 51,34^\circ$$

$$\varphi_{u3} = \arctg\left(\frac{1}{41} \cdot \frac{41}{9}\right) = \arctg\left(\frac{1}{9}\right) = 6,34^\circ$$

$$u_1(t) = 0,494 \cdot \cos(t + 32,91^\circ); u_1' = 0,494 \cdot e^{j \cdot 32,91^\circ}$$

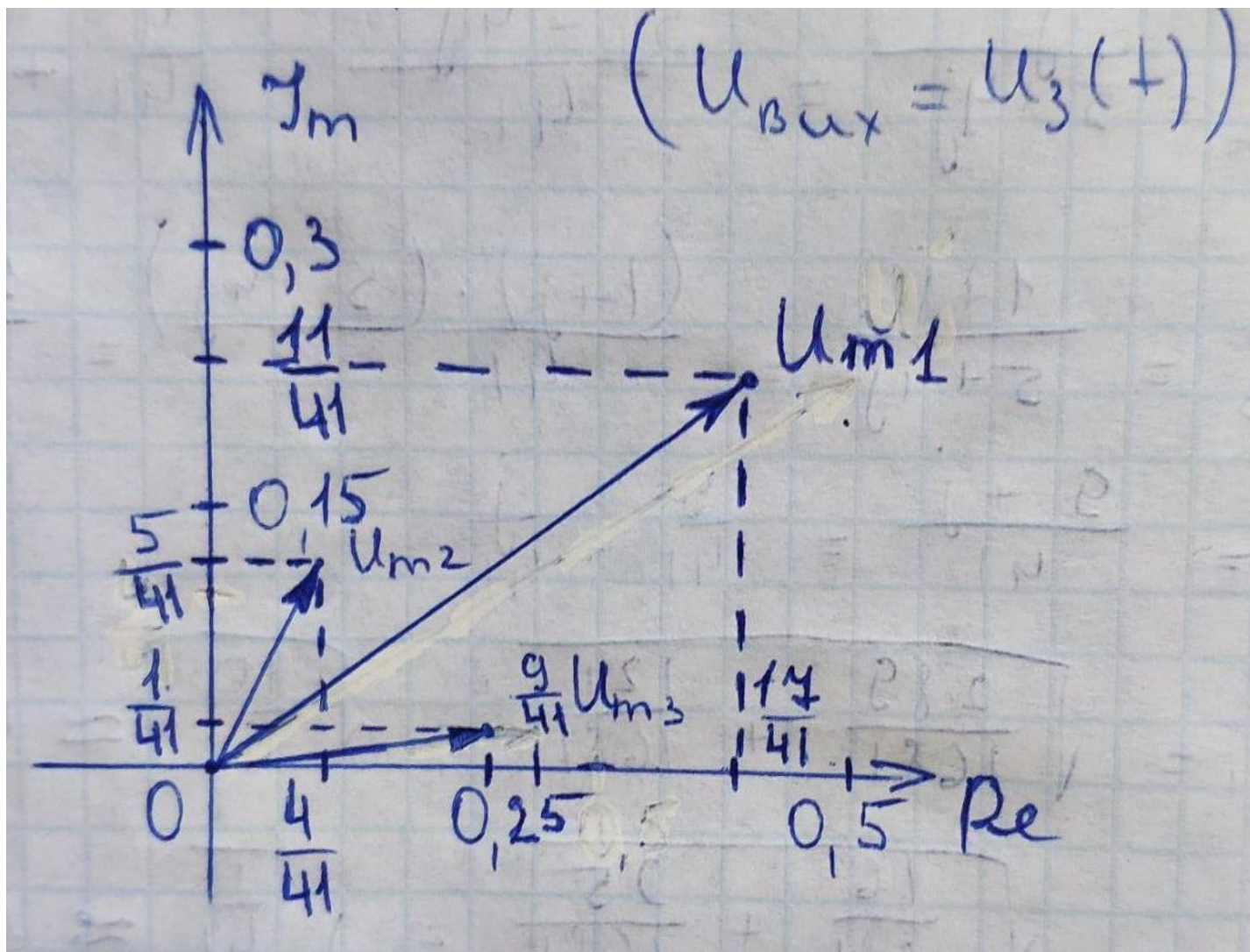
$$u_2(t) = 0,156 \cdot \cos(t + 51,34^\circ); u_2' = 0,156 \cdot e^{j \cdot 51,34^\circ}$$

$$u_3(t) = 0,221 \cdot \cos(t + 6,34^\circ); u_3' = 0,221 \cdot e^{j \cdot 6,34^\circ}$$

$$(U_{max} = u_3(t))$$

↑ U_m

0,3



Порівнявши результати з амплітудно- і фазо- частотними характеристиками на фіксованій частоті, отриманими в завданні 3, впевнився, що значення сходяться.