U_1[V]	U_2 [V]	R_1 [Ω]	R_2 [Ω]	L_1 [mH]	L_2 [mH]	C_1 [μF]	C_2 [μF]	f [Hz]
3	4	10	13	220	70	230	85	75

Nejprve si převedeme hodnoty na zakladní jednotky

$$L_1 = 220mH = 0.22H$$

$$L_2 = 70mH = 0.07H$$

$$C_1 = 230mH = 0.00023F$$

$$C_2 = 85mH = 0.000085F$$

$$\omega = 2\pi f = 2 \cdot \pi 75 = 471.23889803846896//Addunits$$

$$Z_{L1} = 1j\omega L_1 = 1j \cdot 471.23889803846896 \cdot 0.22 = 103.67255756846318j\ \Omega$$

$$Z_{L2} = 1j\omega L_2 = 1j \cdot 471.23889803846896 \cdot 0.07 = 32.98672286269283j\ \Omega$$

$$Z_{C1} = -\frac{1j}{\omega C_1} = -\frac{1j}{471.23889803846896 \cdot 0.00023} = 9.226373512573643j\ \Omega$$

$$Z_{C2} = -\frac{1j}{\omega C_2} = -\frac{1j}{471.23889803846896 \cdot 0.000085} = 24.965481269316918j\ \Omega$$

$$M = \begin{pmatrix} R_2 + R_1 + Z_{C1} + Z_{L1} & -Z_{C1} - R_1 & -R_2 \\ -R_1 - Z_{C1} & Z_{C1} + R_1 + Z_{L2} & -Z_{L2} \\ -R_2 & -Z_{L2} & Z_{L2} + R_2 + Z_{C2} \end{pmatrix} =$$

$$= \begin{pmatrix} 23 + 112.89893108j & -10 - 9.22637351j & -13 \\ -10 - 9.22637351j & 10 + 42.21309638j & -32.98672286j \\ -13 & -32.98672286j & 13 + 57.95220413j \end{pmatrix}$$

$$M^{-1} = \begin{pmatrix} 0.00060133 - 0.00869261j & -0.00252111 - 0.00573255j & -0.0024971 - 0.00395805j \\ -0.00252111 - 0.00573255j & 0.01424775 - 0.03366823j & 0.01046923 - 0.01625012j \\ -0.0024971 - 0.00395805j & 0.01046923 - 0.01625012j & 0.01036954 - 0.02361898j \end{pmatrix}$$

$$P = M_{-1} \cdot \begin{pmatrix} 0 \\ U_1 \\ -U_2 \end{pmatrix} = M^{-1} \cdot \begin{pmatrix} 0 \\ 3 \\ -4 \end{pmatrix} = \begin{pmatrix} 0.00242508 - 0.00136546j \\ 0.00086633 - 0.03600422j \\ -0.01007047 + 0.04572556j \end{pmatrix}$$

$$I_A = 0.00242508 - 0.00136546jA$$

$$I_B = 0.00086633 - 0.03600422jA$$

$$I_C = 0.01007047 + 0.04572556jA$$

$U_{L2} = |Z_{L2} * (I_B - I_C)| =$
$= |32.98672286269283j * ((0.00086633 - 0.03600422j) - (-0.01007047 + 0.04572556j))| =$
$= |2.695997602488855 + 0.3607691906046989j| = 2.720028948653897$ V

$$\varphi = arctan\frac{Im(U_{L2})}{Re(U_{L2})} = arctan\frac{0.3607691906046989}{2.695997602488855} = 0.13302631216320196rad = 7.621846°$$