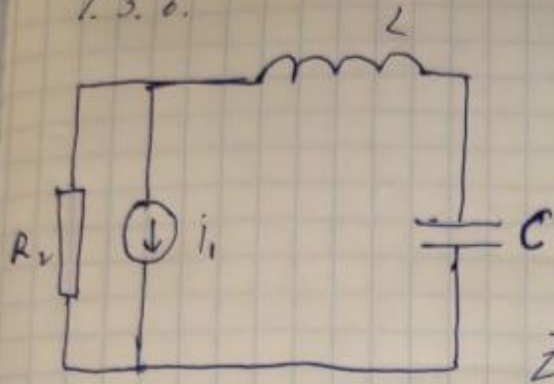
Федоров А. Г. гр. 3331

Вариант №23

1.3.6.



$R_2 = 5$ Ом, $L = 5$ Гн, $C = 0{,}1$ Ф

$i_1 = 10\cos(t - 60°)$

Как было рассчитано в задаче 1.3.5:

$Z_L = 5e^{j\cdot 90°} = 5j$

$Z_C = 10e^{-j\cdot 90°} = -10j$

$Z_{LC} = 5e^{-j\cdot 90°} = -5j$

$Z_{вх} = -\frac{5}{\sqrt{2}} e^{-j\,45°} = \frac{5}{2} - \frac{5}{2}j$

$\dot{I}_1 = 10e^{-j\,180°} = -10$

$\dot{I}_2 = \frac{5\sqrt{2}}{} e^{j\cdot 135°} = -5 + 5j$

$\dot{I}_{LC} = 5\sqrt{2}\, e^{-j\,135°} = -5 - 5j$

$\dot{U}_1 = \dot{U}_2 = \dot{U}_{LC} = \dot{I}_{LC} \cdot Z_{LC} = 5\sqrt{2}\, e^{-j\cdot 135°} \cdot 5e^{-j\cdot 90°} = 25\sqrt{2}\, e^{j\,135°}$

$\dot{U}_L = \dot{I}_{LC} \cdot Z_L = 5\sqrt{2}\, e^{-j\cdot 135°} \cdot 5e^{j\cdot 90°} = 25\sqrt{2}\, e^{-j\,45°}$

$\dot{U}_C = \dot{I}_{LC} \cdot Z_C = 5\sqrt{2}\, e^{-j\cdot 135°} \cdot 10e^{-j\,90°} = 50\sqrt{2}\, e^{j\cdot 135°}$

$\overline{P_{S1}} = -\dot{U}_1 \cdot I_1 = -25\sqrt{2}\, e^{j\,135°} \cdot 10e^{-j\,180°} = 250\sqrt{2}\, e^{-j\,135°} = -250 + 250j$

$P_{S1} = 250\sqrt{2}$ $P_1 = -250$ $P_{Q1} = 250$

$\overline{P_{S2}} = \dot{U}_2 \cdot \dot{I}_2 = 25\sqrt{2}\, e^{j\,135°} \cdot 5\sqrt{2}\, e^{j\,135°} = 250e^{-j\cdot 90°} = -250j$

$P_{S2} = 250$ $P_2 = 0$ $P_{Q2} = -250$

$\overline{P_{SL}} = \dot{U}_L \cdot \dot{I}_{LC} = 25\sqrt{2}\, e^{-j\cdot 45°} \cdot 5\sqrt{2}\, e^{-j\cdot 135°} = 250\, e^{-j\,180°} = -250$

$P_{SL} = 250$ $P_L = -250$ $P_{QL} = 0$

$\overline{P_{SC}} = \dot{U}_C \cdot \dot{I}_{LC} = 50\sqrt{2}\, e^{j\cdot 135°} \cdot 5\sqrt{2}\, e^{-j\cdot 135°} = 500\, e^{j\cdot 0°} = 500$

$P_{SC} = 500$ $P_C = 500$ $P_{QC} = 0$

$$\overline{P}_{S1} + \overline{P}_{S2} + \overline{P}_{SL} + \overline{P}_{SC} = -250 + 250j - 250j + 250 + 500 = 0$$