

## Расчетно-графическая работа

Расчет простой цепи однофазного переменного синусоидального тока

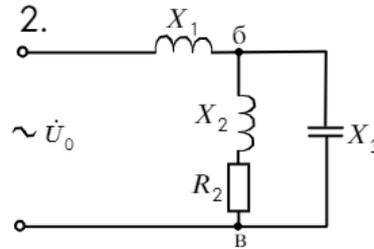
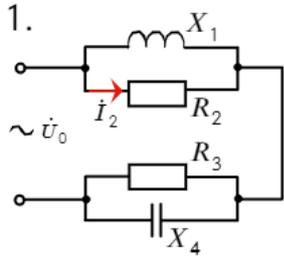
Даны электрические схемы и их параметры.

Найти: мгновенные значения напряжения и тока на источнике  $u_0(t), i_0(t)$

комплексы всех действующих значений токов и напряжений в ветвях и на элементах отдельно.

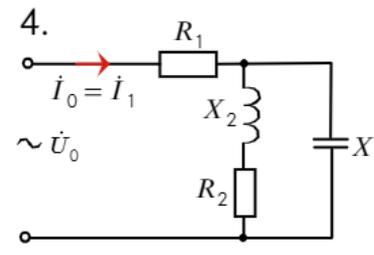
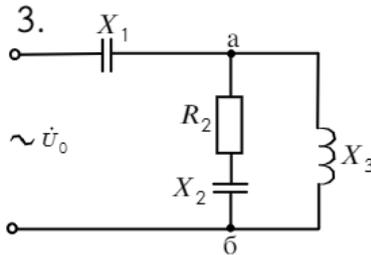
Осуществить проверку расчетов балансом мощности. Построить векторную диаграмму (ВД) токов и напряжений (можно совмещенную, можно раздельно).

$$\begin{aligned} I_2 &= 12 \text{ A} \\ R_2 = R_3 &= 10 \text{ Ом} \\ X_1 = X_4 &= 10 \text{ Ом} \end{aligned}$$



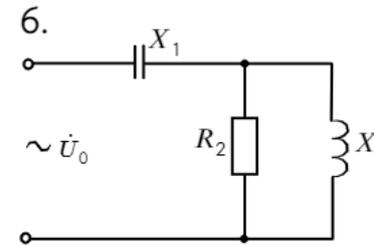
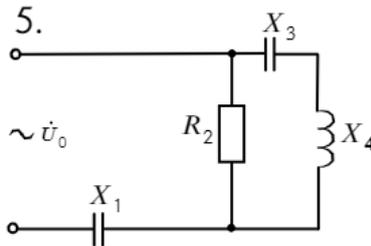
$$\begin{aligned} U_{ab} &= 100 \text{ В} \\ R_2 &= 10 \text{ Ом} \\ X_1 = X_2 = X_3 &= 10 \text{ Ом} \end{aligned}$$

$$\begin{aligned} P_2 &= 4000 \text{ Вт} \\ R_2 = X_2 &= 10 \text{ Ом} \\ X_1 = X_3 &= 20 \text{ Ом} \end{aligned}$$



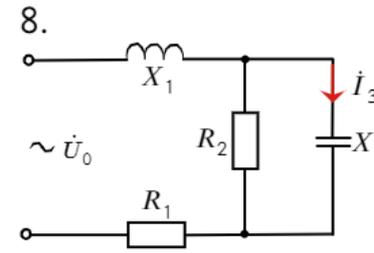
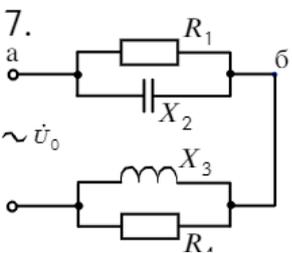
$$\begin{aligned} I_1 &= 10 \text{ A} \\ R_2 = X_2 &= 5 \text{ Ом} \\ R_1 = X_3 &= 10 \text{ Ом} \end{aligned}$$

$$\begin{aligned} P_2 &= 1000 \text{ кВт} \\ R_2 &= 10 \text{ Ом} \\ X_1 = X_3 &= 5 \text{ Ом} \\ X_4 &= 15 \text{ Ом} \end{aligned}$$



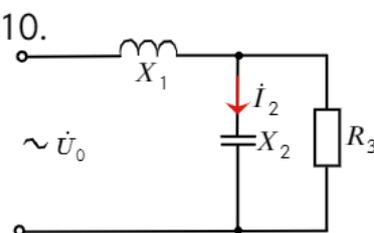
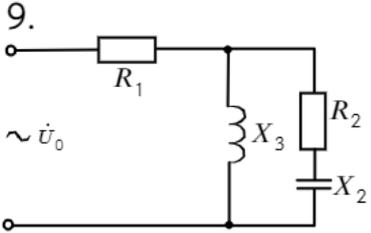
$$\begin{aligned} Q_0 &= 2000 \text{ вар} \\ R_2 &= 10 \text{ Ом} \\ X_1 = X_3 &= 10 \text{ Ом} \end{aligned}$$

$$\begin{aligned} U_{ab} &= 100 \text{ В} \\ R_1 = R_4 &= 10 \text{ Ом} \\ X_2 = X_3 &= 10 \text{ Ом} \end{aligned}$$



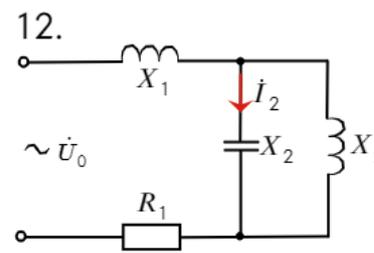
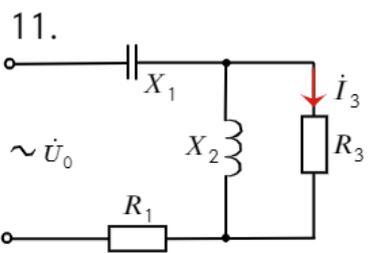
$$\begin{aligned} I_3 &= 10 \text{ A} \\ R_1 = X_1 &= 5 \text{ Ом} \\ R_2 = X_3 &= 10 \text{ Ом} \end{aligned}$$

$$\begin{aligned} Q_3 &= 1000 \text{ вар} \\ R_1 = X_3 &= 10 \text{ Ом} \\ R_2 = X_2 &= 5 \text{ Ом} \end{aligned}$$



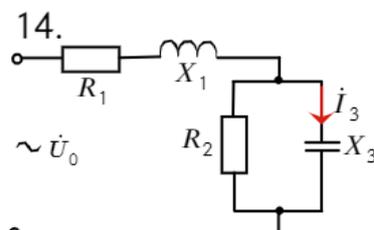
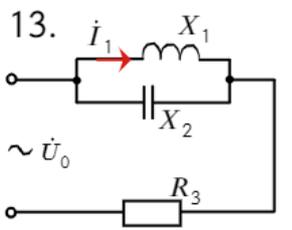
$$\begin{aligned} I_2 &= 10 \text{ A} \\ X_1 &= 5 \text{ Ом} \\ X_2 = R_3 &= 10 \text{ Ом} \end{aligned}$$

$$\begin{aligned} I_3 &= 10 \text{ A} \\ R_1 = X_1 &= 5 \text{ Ом} \\ X_2 = R_3 &= 10 \text{ Ом} \end{aligned}$$



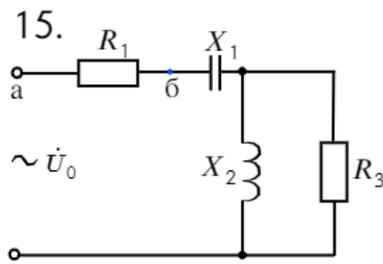
$$\begin{aligned} I_2 &= 20 \text{ A} \\ R_1 = X_1 = X_3 &= 10 \text{ Ом} \\ X_2 &= 5 \text{ Ом} \end{aligned}$$

$$\begin{aligned} I_1 &= 10 \text{ A} \\ R_3 = X_1 &= 10 \text{ Ом} \\ X_2 &= 5 \text{ Ом} \end{aligned}$$

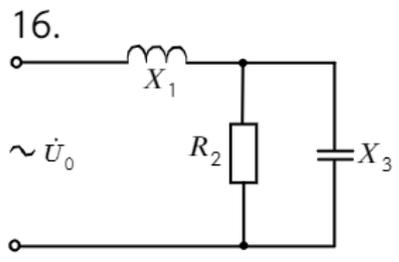


$$\begin{aligned} Q_{x3} &= 1000 \text{ вар} \\ R_1 = R_2 = X_3 &= 10 \text{ Ом} \\ X_1 &= 20 \text{ Ом} \end{aligned}$$

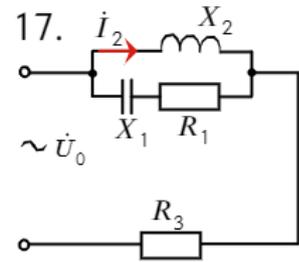
$U_{a\delta} = 100 \text{ B}$   
 $R_1 = X_1 = 10 \text{ OM}$   
 $R_3 = X_2 = 10 \text{ OM}$



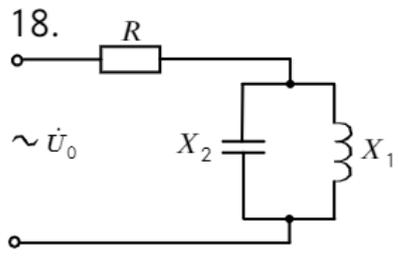
$P_R = 1000 \text{ B}\tau$   
 $X_1 = X_3 = 10 \text{ OM}$   
 $R_2 = 10 \text{ OM}$



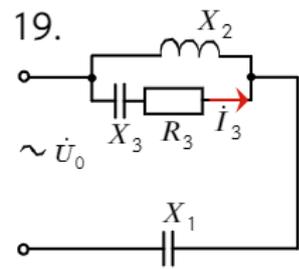
$I_2 = 10 \text{ A}$   
 $R_1 = X_1 = 5 \text{ OM}$   
 $R_3 = X_2 = 10 \text{ OM}$



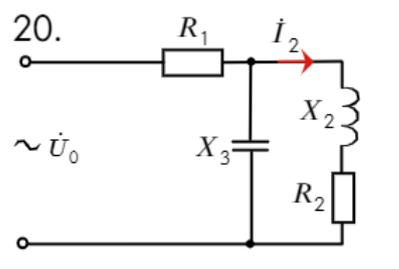
$I_0 = 10 \text{ A}$   
 $R = X_1 = 10 \text{ OM}$   
 $X_2 = 5 \text{ OM}$



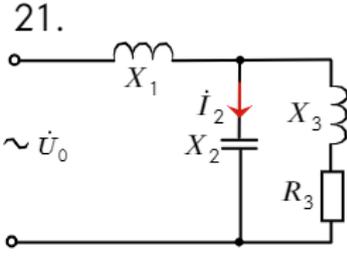
$I_3 = 10 \text{ A}$   
 $X_1 = X_2 = 10 \text{ OM}$   
 $R_3 = X_3 = 5 \text{ OM}$



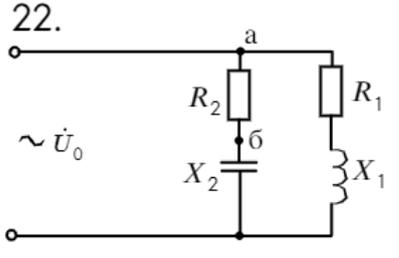
$I_2 = 10 \text{ A}$   
 $R_1 = X_3 = 10 \text{ OM}$   
 $R_2 = X_2 = 5 \text{ OM}$



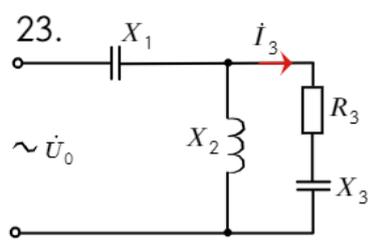
$I_2 = 10 \text{ A}$   
 $X_1 = X_2 = 10 \text{ OM}$   
 $R_3 = X_3 = 5 \text{ OM}$



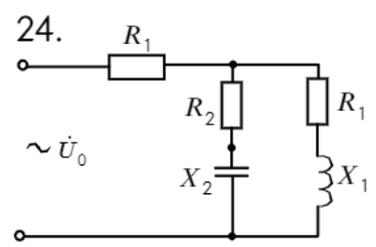
$U_{a\delta} = 100 \text{ B}$   
 $R_1 = X_1 = 10 \text{ OM}$   
 $R_2 = X_2 = 10 \text{ OM}$



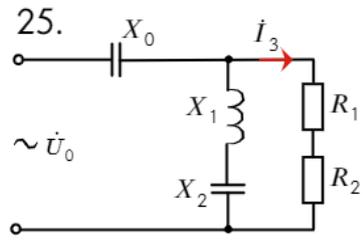
$I_3 = 12 \text{ A}$   
 $X_1 = X_2 = 8 \text{ OM}$   
 $R_3 = X_3 = 4 \text{ OM}$



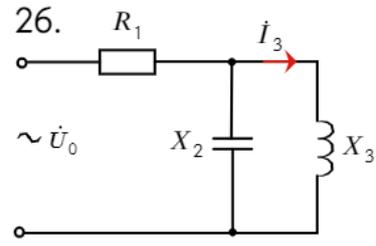
$I_3 = 10 \text{ A}$   
 $R_1 = 10 \text{ OM}$   
 $R_2 = X_2 = 10 \text{ OM}$   
 $R_3 = X_3 = 10 \text{ OM}$



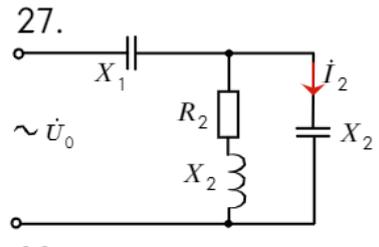
$I_3 = 4 \text{ A}$   
 $R_1 = R_2 = X_2 = 3 \text{ OM}$   
 $X_1 = 9 \text{ OM}$   
 $X_0 = 6 \text{ OM}$



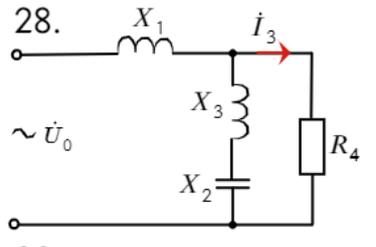
$I_3 = 10 \text{ A}$   
 $R_1 = X_3 = 20 \text{ OM}$   
 $X_2 = 10 \text{ OM}$



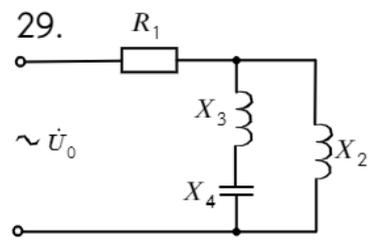
$I_2 = 5 \text{ A}$   
 $X_2 = 20 \text{ OM}$   
 $X_1 = 20 \text{ OM}$   
 $R_3 = X_3 = 10 \text{ OM}$



$I_3 = 10 \text{ A}$   
 $X_2 = 20 \text{ OM}$   
 $X_1 = X_3 = 10 \text{ OM}$   
 $R_4 = 10 \text{ OM}$



$P_{R1} = 2000 \text{ B}\tau$   
 $X_3 = 10 \text{ OM}$   
 $R_1 = X_2 = X_4 = 20 \text{ OM}$



$U_{a\delta} = 100 \text{ B}$   
 $X_1 = X_4 = R_3 = 10 \text{ OM}$   
 $X_2 = 20 \text{ OM}$

