1. Knowing the circuit from figure 1 as being with a three phase direct symmetrically system of voltage u10, u20, u30, with V and , determine the instantaneous values of the currents, the phasor‘s diagram and verify the results with power balance.

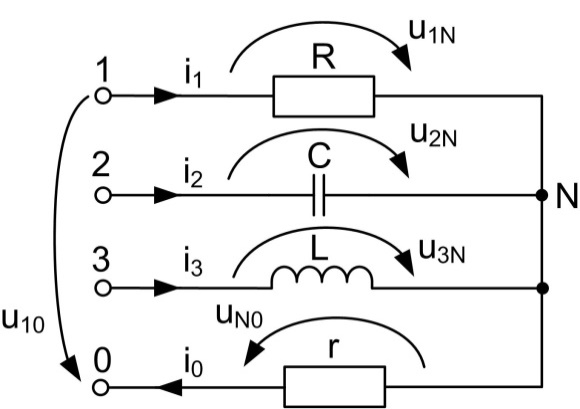
****

Fig. 1a

The consumer is an unbalanced one and we have to compute the voltage drop on the neutral conductor with Millman’s theorem:

:

The complex values of the voltage direct symmetrically supply system is:

By introducing all the values in the Millmann ‘s formula is obtained

The currents will be computed by diminishing the applied voltage on each phase with the voltage drop on the neutral conductor:

The phasor’s diagram is in the figure 1b.

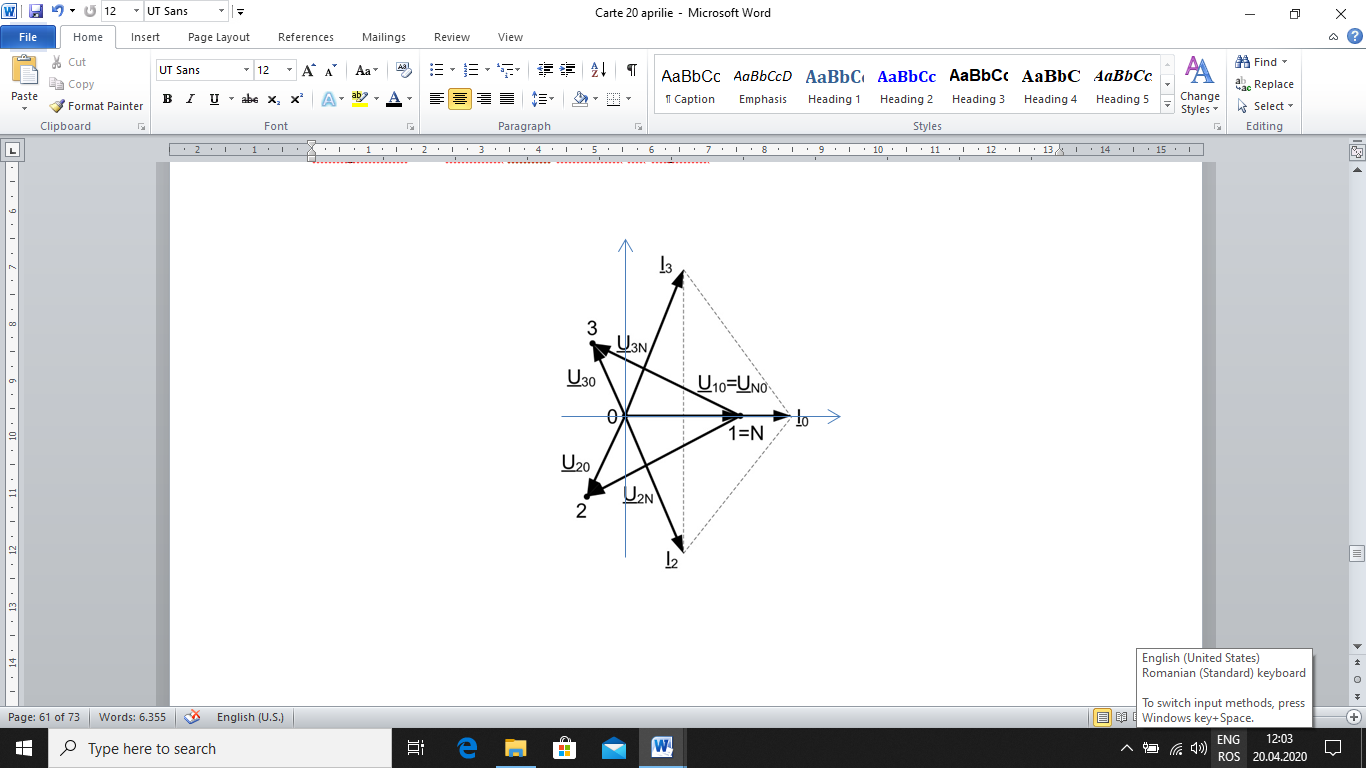


Fig.1b.

We transform then the complex values of the currents into instantaneous values:

Power balance

Because the load is unbalanced, we compute the apparent complex power supplied in the circuit by the supply system as a sum of the apparent complex power on each phase:

The absorbed active power and the absorbed reactive power will be:

2. Knowing that the circuit is supplied by a symmetrical system of u10, u20, u30, and V.

determine the currents, the phasor’s diagram and verify the results with power balance in two situations: a closed, a opened.

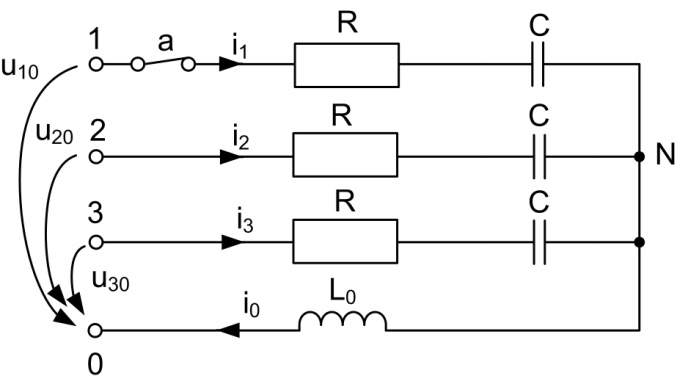
****

Fig. 2a

a. *a* closed

The instantaneous value is:

The other currents from the symmetrical system of currents will be:

i0=0.

The phasor’s diagram for voltages and currents is represented in figure 2b.

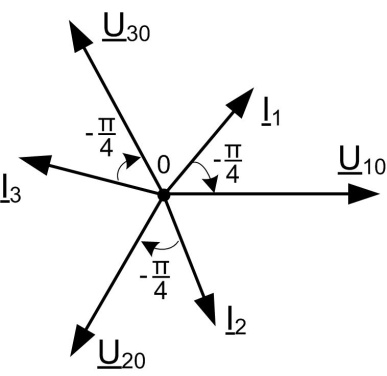
****

Fig. 2b.

Power balance

b. *a* opened

The voltage drop on the neutral conductor with Millman’s theorem:

The phase currents:

*Verification*

Phasor’s diagram for case b is represented in figure 2c.

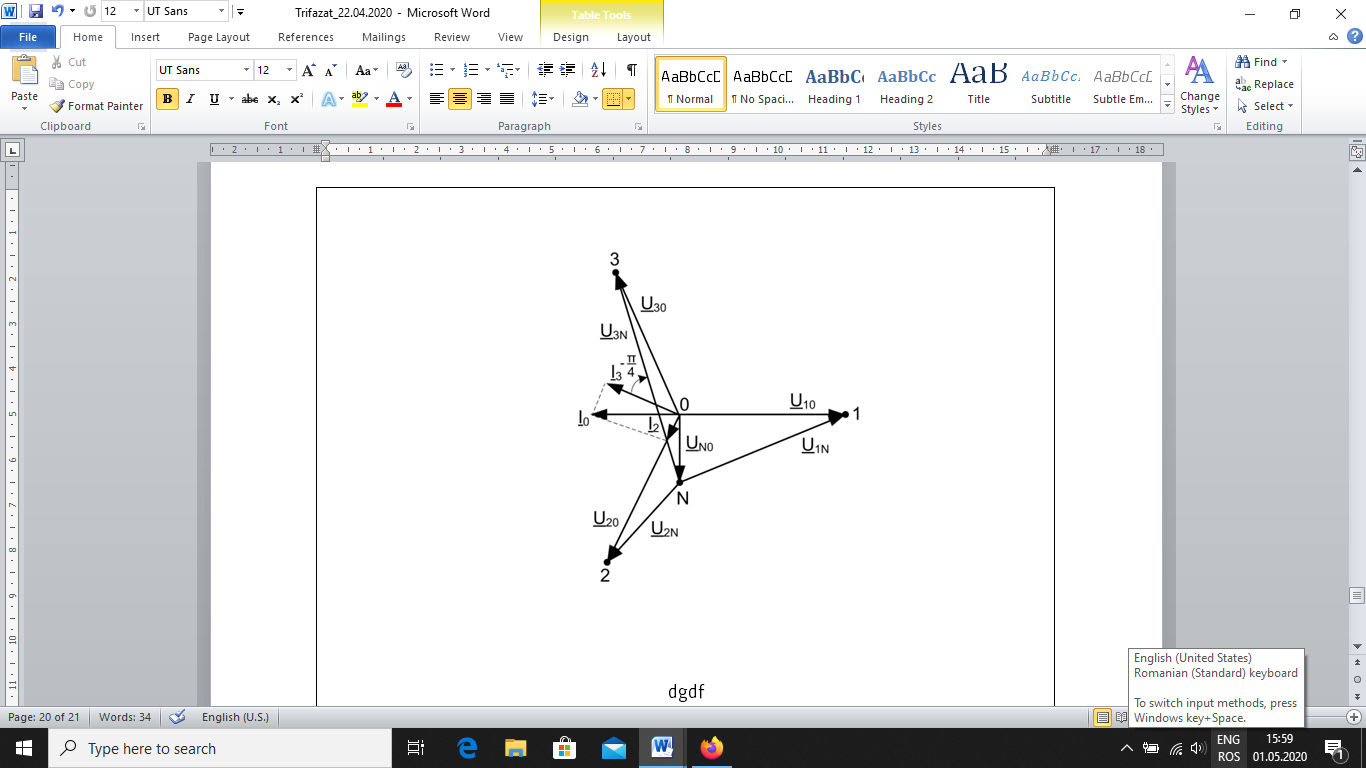


Fig. 2c

Power balance

.