

# task\_9xy69axg3gi3nr26\_with\_calculation

## Student Group

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### Exercise E16 Complex series circuit (written test, approx. 8 % of a 120-minute written test, SS2021)

A) Determine the absolute value of the result  $200 \text{ } \Omega$  in the diagram of the series circuit with the input impedance vector diagram. Pay attention to the correct dimensioning.

a) Determine the complex impedance  $\underline{Z}_C$ .

Result

$$\underline{Z}_C = -j \cdot 804 \text{ } \Omega$$

Path

The complex impedance  $\underline{Z}_C$  is given as

$$\underline{Z}_C = \frac{1}{j \cdot 2\pi \cdot f \cdot C} = \frac{-j}{2\pi \cdot 40 \cdot 10^3 \text{ Hz} \cdot 4.95 \cdot 10^{-9} \text{ F}} = -j \cdot 803.81... \text{ } \Omega$$

Based on the diagram:  $|\underline{Z}| = 828 \text{ } \Omega$

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Last update: 2024/07/04 00:46

