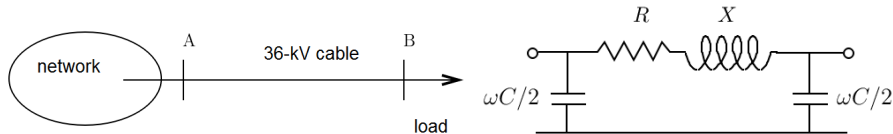


Exercise 1

In the system shown in the left figure, the load at bus B behaves as a constant admittance. It consumes 15 MW under a voltage of 36 kV, and has a power factor of 0.94 (inductive).



That load is fed through a 20-km cable with a nominal voltage of 36 kV and with the per phase equivalent circuit given in the right figure. The parameters of that circuit are as follows: $R = 0.1 \Omega/\text{km}$, $X = 0.15 \Omega/\text{km}$, $\omega C/2 = 40 \mu\text{S}/\text{km}$.

Consider an operating point with a voltage of 38 kV at bus A.

- 1 Determine the voltage at bus B.
- 2 Check the active and reactive power balances of the system.
- 3 The load is connected in delta. Assuming that each branch can be represented by an equivalent RL circuit, determine the value of R in Ω and L in H .