**Mid-term problem**
Consider a 1D steel slab of thickness $L=15\,\text{cm}$. One of the boundary surfaces, that at $x=0$, is kept at temperature $T_A=-20\,^\circ\text{C}$ and the other at $T_B=20\,^\circ\text{C}$.

a) Developed an analytical expression for the one-dimensional steady temperature distribution $T(x)$ within the slab.

b) Evaluate numerically with the finite difference method the temperature at location $x=5\,\text{cm}$ and $x=10\,\text{cm}$ and compare with analytical solution p.(a)

c) Calculate temperature distribution using Ansys Fluent and compare results with p.(b) (In order to get 1D solution set two walls as required and remaining wall as adiabatic). If you calculate 2D case don’t forget set-up Design modeler parameter to 2D mode.