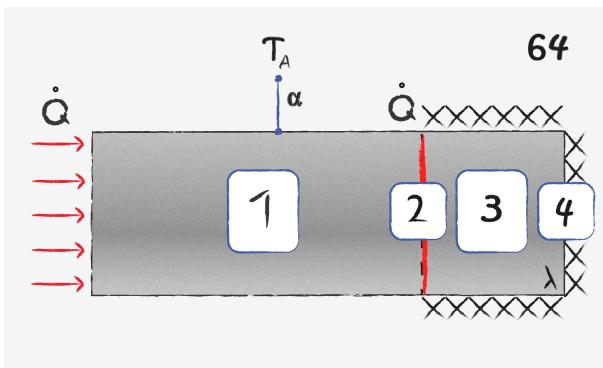


Heat Conduction: Task 64



The image illustrates a fin-type body with a convective heat transfer to the sides. On the left side, a heat flux \dot{Q} is imposed while a line source with the same heat flux exists prior to an adiabatic section. Note that due to the adiabatic section, no heat is transferred from the line heat source to the right side. The problem then becomes symmetric with a heat flux from both sides into the fin.

- 1  Due to the explained symmetry, the temperature on the left side needs to be equal to the temperature at the line heat source. The temperature decreases towards the center of the body due to the convective heat transfer.
- 2  The right side is fully adiabatic. Thus, the temperature gradient is zero. On the left side, all the heat released by the heat source needs to be conductively transported to the left. Thus, the temperature gradient is positive.
- 3  The right side is fully adiabatic. Thus, the temperature gradient is zero.
- 4  The right side is fully adiabatic. Thus, the temperature gradient is zero.