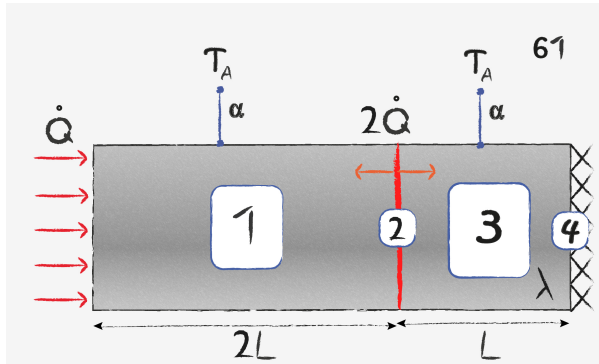# Heat Conduction: Task 61

The image shows a body of constant thermal conductivity with an imposed heat flux on the left side and an adiabatic wall on the right side. The sidewalls of the body are in thermal exchange with the ambient T_A due to convection. A line heat source exist within the body with the same heat flow $\dot{Q}$ as on the left side. The arrows illustrates that a heat flux to the left and the right side exist.

1

In the first part of the body, heat enters from the left and the right side. Because of symmetry reasons the flux $2\dot{Q}$ from the line source is splitted equally to both sides. In the center of the first body part, the temperature gradient is zero

2

The temperature at the location of the heat source has a kink. Because the heat flux transferred to both sides is equal, the gradients are equal as well.

3

The temperature decreases from the location of the heat source and appoaches a zero-gradient boundary condition on the right side.

4

Due to the adiabatic side, the temperature gradient is zero.