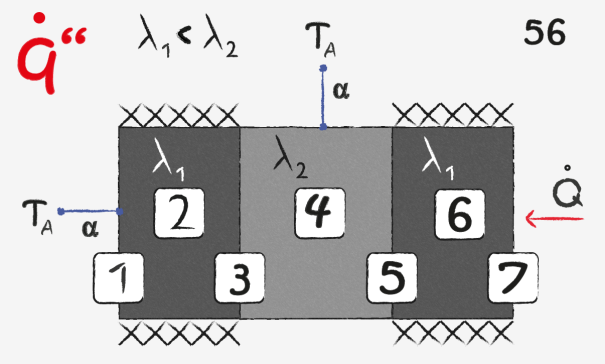
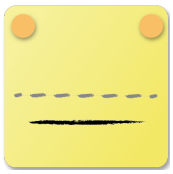
Axial Heat Flux: Task 56



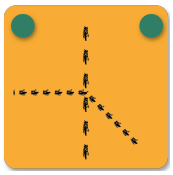
The image describes a rectangular body consisting of three sections. Walls are convective in section 2 and the left boundary of section 1. There is an imposed heat flux at the right boundary, remaining surfaces are adiabatic.

1 

Due to convective heat loss, the heat flux is negative at the left boundary.

2 

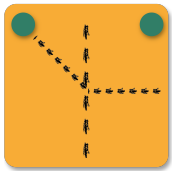
Specific heat flux remains constant, since cross section area does not change in this section, just as the overall heat flux stays constant.

3 

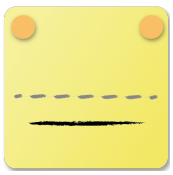
A kink in specific heat flux is caused by convective heat transfer, that is present right from the point of transition.

4 

As temperature delta is increasing towards the right, the specific heat flux and it's gradient is so too.

5 

The transition is characterized by another kink, caused by the end of the convective heat transfer.

6 

Specific heat flux is constant for the same reasons mentioned in the first section.

7 

The negative sign is due to the given orientation of the imposed heat flux towards the left.