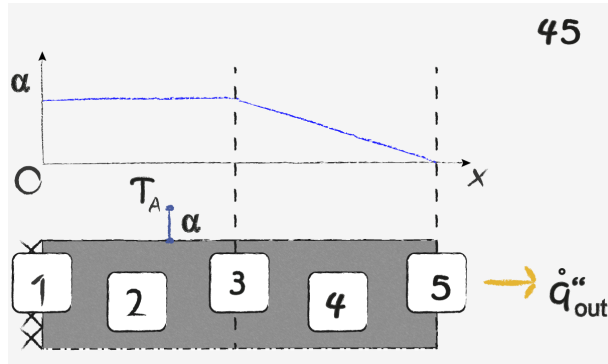




Heat Conduction: Task 45



The image describes a rectangular body with constant heat conduction coefficient from the left to the middle part and then decreasing linearly to the right. The wall on the left side is adiabatic and the heat flows out from the right side.

1



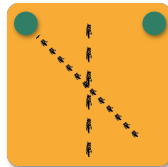
On the adiabatic wall the temperature gradient is zero.

2



The given heat flux \dot{q}_{out}'' indicates a convective heating of the fin. The heat flux increases towards the right, that is the temperature profile gets steeper.

3



The heat transfer coefficient is continuous at the transition and so is the temperature gradient.

4



Due to convective heating, the absolute slope of the temperature increases. Taken into account the negative sign of the temperature gradient that means the gradient is further decreasing.

5



To satisfy the condition of the outward oriented heat flux, the temperature gradient is still negative at the right.