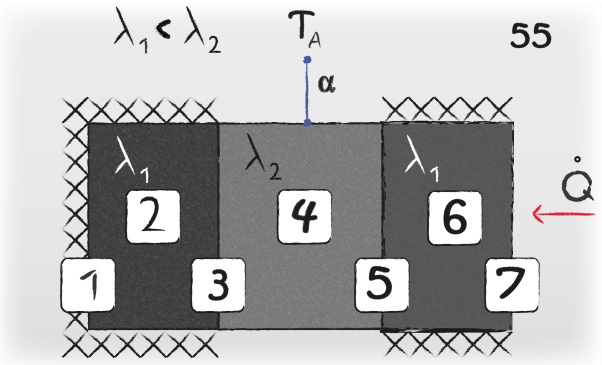
Heat Conduction: Task 55



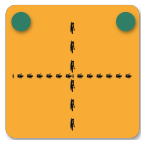
The image describes that there are three rectangular walls. First and third walls are adiabatic and have the same heat conductivity. Heat flux is coming from right hand side. Consider convection in the middle.

1 

On the adiabatic wall the temperature gradient is zero

2 

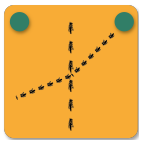
There is no heat transport through this area (due to the isolation) so the temperature gradient is zero.

3 

There is no heat transport through the interface so the temperature gradient is zero.

4 

Due to the heat loss through convection, the temperature gradient decreases from right to left and to meet the condition at the left interface (no heat transport), the temperature gradient must be zero there.

5 

λ_1 is smaller than λ_2 which means the Temperature gradient in 1 is steeper than in 2.

6 

According to Fourier's law. At constant area and heat conductivity the temperature gradient decreases linearly from right to left.

7 

The temperature gradient on the right side is decreasing from right to left.