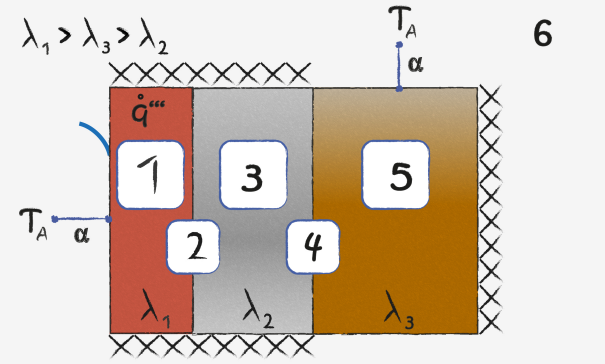
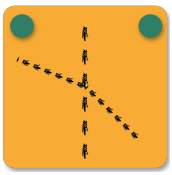
Heat Conduction: Task 6



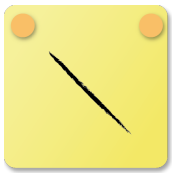
The image describes a rectangular body with a heat source on the left side. In the first and second area, the walls are isolated from top and bottom. In the third area the wall on the right side is isolated.

1 

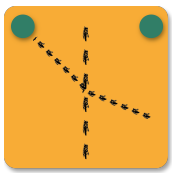
Due to the Heat production and heat flux in both directions, there must be a maximum in the area 1 and since the thermal resistance to the left is smaller than to the right, then the temperature gradient to the left must be steeper

2 

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

3 

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

4 

λ_2 is smaller than λ_3 which means the Temperature gradient in 2 is steeper than in 3

5 

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