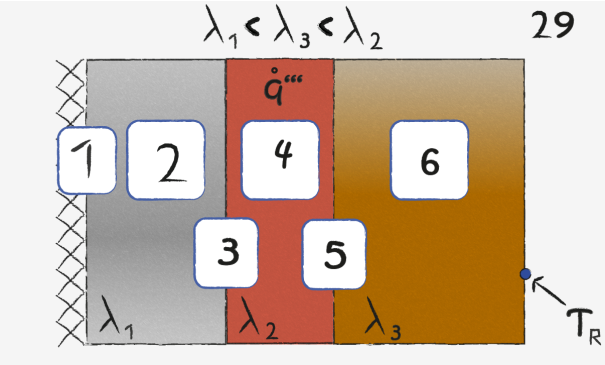
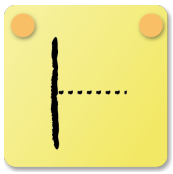
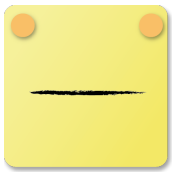
Heat Conduction: Task 29



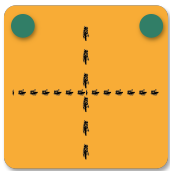
The image describes a rectangular body with three different heat conductivities and homogeneous heat production in the middle part. The wall on the left side is adiabatic.

1 

On an adiabatic wall there is no heat transport so the temperature gradient is zero.

2 

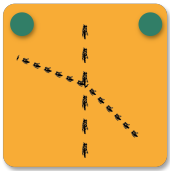
There is no heat transport through this area so the temperature gradient is zero.

3 

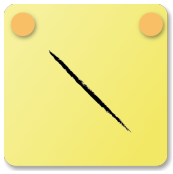
There is no heat transport through the interface so the temperature gradient is zero.

4 

To meet the condition on the left side, the temperature gradient is zero. Due to the constantly increasing heat-flux (heat source), the temperature gradient increases constantly from left to right.

5 

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

6 

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