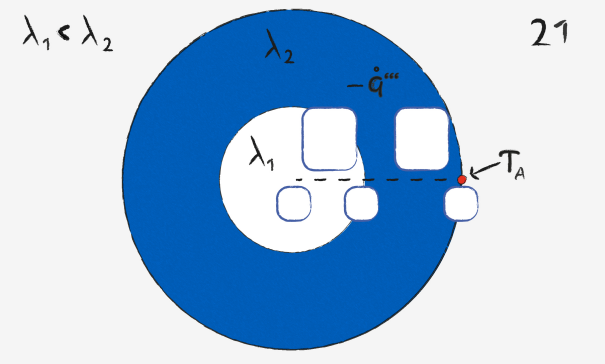
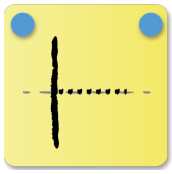
Axial Heat Flux: Task 21



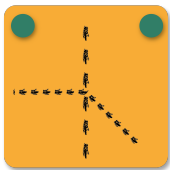
The image describes a cylindrical body consisting of to layers of infinite expansion. The outer compartment contains a volumetric heat sink.

1 

Due to symmetry reasons, the specific heat flux at the center is zero.

2 

Since no heat is brought into the system, the specific heat flux remains zero.

3 

The transition is characterized by a kink in specific heat flux, as it marks the beginning of the volumetric heat sink.

4 

The volumetric heat sink causes the specific heat flux to decrease proportional to $r - \frac{r_\mathrm{i}^2}{r}$, where r_i describes the radius of the inner compartment.

5 

To fulfill the energy balance in a steady case, the specific heat flux is negative at the boundary, indicating a flux from outside to inside.