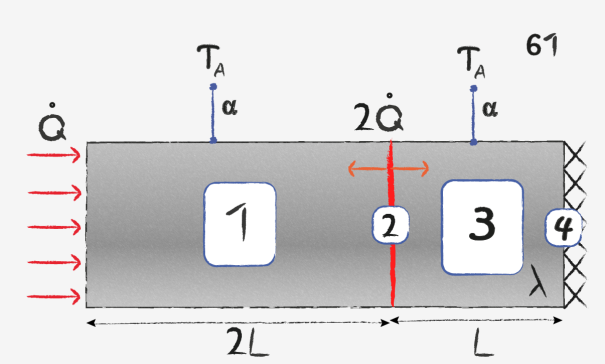
Heat Conduction: Task 61



The image describes a fin with an imposed heat flux at the left boundary and a adiabatic fin head at the right boundary. Remaining surfaces are convective and there is a 2D heat source at $x = 2L$ in axial direction.

1

In the first section there is a temperature minimum at the center due to given heat fluxes towards this section from it's boundaries and heat loss via convection.

2

There is a singularity in heat flux at the intersection where it jumps from $-\dot{Q}$ to $\dot{Q}$. Hence, the gradient's sign switches from positive to negative. The magnitude of temperature gradient or heat flux respectively, is equal. This becomes obvious by considering values for length and heat fluxes, as the problem can be devided into three sections of length L that are symmetrical in respect to their contacts when it comes to temperature and heat flux.

3

The right section is characterized by essentially a standard fin temperature profile.