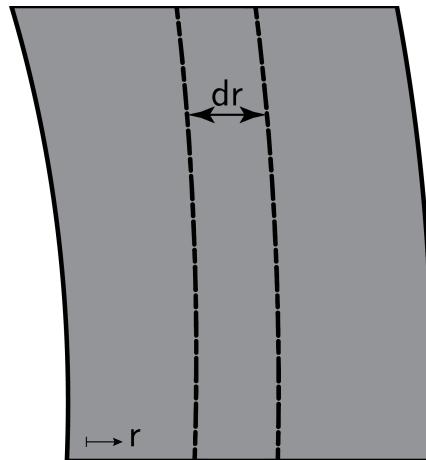


# Control Volume - Cond. - IE 9

A hot pipe loses heat due to cold surrounding air. Pick the correct control volume for setting up an energy balance to calculate the temperature profile inside the pipe wall. If needed, also define the coordinate system.



The temperature profile in a body can be determined by solving the heat equation. The heat equation yields from setting up an energy balance of an infinitesimal element inside the relevant body.

The temperature only changes when moving from left to right, which we will refer to as the radial direction  $r$ . As we are dealing with a cylindrical body, a one-dimensional infinitesimal element in cylindrical coordinates is suitable for solving the problem.