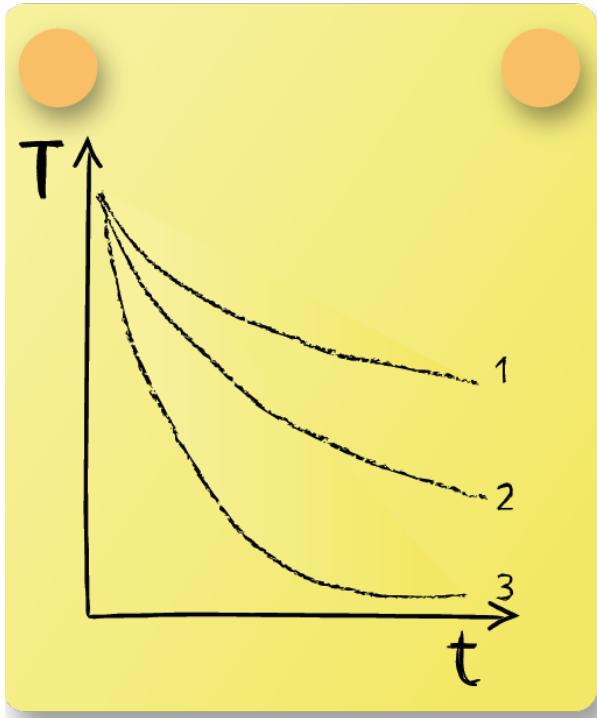# Lecture 6 - Question 3

A sphere, a cube and a thin circular plate of the same volume and material are heated up to the same temperature. Afterwards they are cooling down under equal ambient conditions. Assume a Biot Number of Bi $\ll$ 1 and assign the objects to the temperature graphs.

For a Biot Number Bi $\ll$ 1 thermal resistance within the bodies can be neglected and such a uniform temperature distribution can be assumed. Heat loss of the objects is than determined by the difference of the body's temperature and ambient temperature as well as the heat transfer coefficient and surface area. Since the bodys are of the same volume, the relation of their surface areas is only depending on their shapes, yielding: $A_{\mathrm{plate}} > A_{\mathrm{cube}} > A_{\mathrm{sphere}}$, which is the order of fastest to slowest cool down.