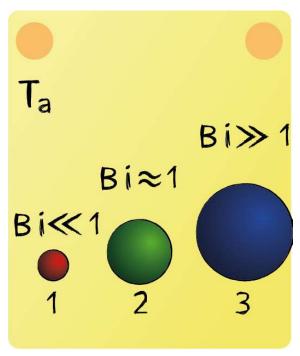


Lecture 10 - Question 3



Consider three spheres cooling down. For sphere 1 Bi << 1, for sphere 2 Bi \approx 1 and for sphere 3 Bi >> 3. The center temperature is denoted by $T_{\rm r=0}$ and the surface temperature by $T_{\rm r=R}$ for all the three spheres. Which answer is correct?

The difference between $T_{r=0}$ and $T_{r=R}$ is the smallest for sphere 1 and the biggest for sphere 3.



For sphere 1 it is known that $Bi \ll 1$, implying that the temperatures inside the body will not vary significantly and thus the difference between $T_{\rm r=0}$ and $T_{\rm r=R}$ is the smallest for this sphere.

For sphere 3 it is known that Bi >> 1, implying that the temperatures inside the body will vary significantly and thus the difference between $T_{\rm r=0}$ and $T_{\rm r=R}$ is the biggest for this sphere.