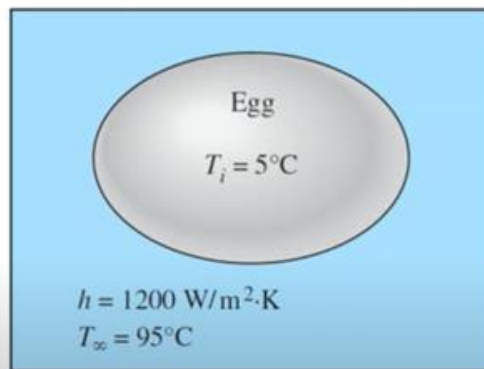


Transient Heat Transfer Demonstration Problem



$r = 2.5 \text{ cm}$
 $k = 0.627 \text{ W/m}\cdot\text{K}$
 $\rho = 993.05 \text{ kg/m}^3$
 $c_p = 4178.5 \text{ J/kg}\cdot\text{K}$
 $T_i = 5^\circ\text{C}$
 $h = 1200 \text{ W/m}^2\cdot\text{K}$

The time at which the center of the egg reaches 70°C ?

A screenshot of a table from a software interface, likely COMSOL, showing the time at which the center of the egg reaches 70°C . The table has two columns: "Time (s)" and "Temperature (degC)". The row where the temperature is 70.042 is highlighted, and a mouse cursor is pointing at the time value 860.00 .

Time (s)	Temperature (degC)
845.00	69.135
850.00	69.441
855.00	69.743
860.00	70.042
865.00	70.336
870.00	70.627
875.00	70.913
880.00	71.196

Reference: COMSOL Conduction heat transfer - Boiling Eggs,
<https://www.youtube.com/watch?v=HZtdfpbAz9E>

Abaqus solution (axisymmetric transient heat transfer)

Abaqus Consistent Units

Quantity	SI	SI (mm)	US Unit (ft)	US Unit (inch)
Length	m	mm	ft	in
Force	N	N	lbf	lbf
Mass	kg	tonne (10^3 kg)	slug	$\text{lbf s}^2/\text{in}$
Time	s	s	s	s
Stress	Pa (N/m^2)	MPa (N/mm^2)	lbf/ft^2	psi (lbf/in^2)
Energy	J	mJ (10^{-3} J)	ft lbf	in lbf
Density	kg/m^3	tonne/mm^3	slug/ft^3	$\text{lbf s}^2/\text{in}^4$