

ME 323, Spring 2008, Tues. May 27

Homework #8, due Tues. June 3 beginning class, (text: Incropera & DeWitt, ID)

Reading (ID) Chpt 9: Free Convection

9.1, 9.3-9.6, 9.9, heavily skim the rest

Free Convection

- Physical considerations
- Dimensionless parameters
- Correlations: laminar/turbulent, flat plate (inclination), cylinders, spheres, etc.
- Combined forced and free convection

Problems (ID):

9.5

9.7

Hint: Laminar δ_T governed by η and has thickness at $\eta \cong 5$, see fig. 9.4a, eq. 9.13.

9.40

9.97

Hint: use eqn. 9.26 for the surfaces in contact with the surrounding; use 9.52 for the enclosure