Homework 1

1. B&L (8th edition): 1.4
2. B&L (8th edition): 1.5
3. B&L (8th edition): 1.14
4. B&L (8th edition): 1.17
5. Heat is being generated uniformly inside a plate at a rate of q-dot W/m^3. Plate is of thickness $2a$, and infinite in the other two directions. Both surfaces are at temperature T_s. Assume **steady-state** conditions.
    a. What is the heat flux on the surface of the plate ($q'' \ W/m^2$).
    b. If the plate is being cooled by a fluid at temperature T_f, what is the heat transfer coefficient h. (Units)
    c. What is the slope dT/dx at the surface, if the plate is made of: a) metallic U, b) UO2, c) Cu?

T_f T_s | T_s T_f
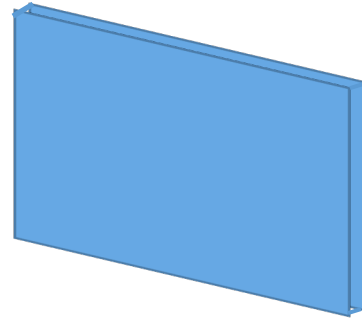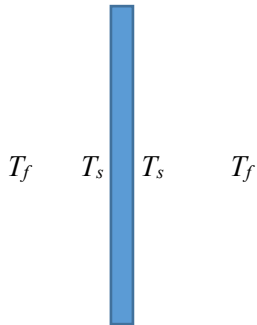
q-dot = *10 MW/m³*; *a* = 0.005 m, T_f = 325 C, T_s = 350 C

6. Repeat problem 5 for a sphere of radius R. ($R = 0.01 \ m$)

T_s T_f