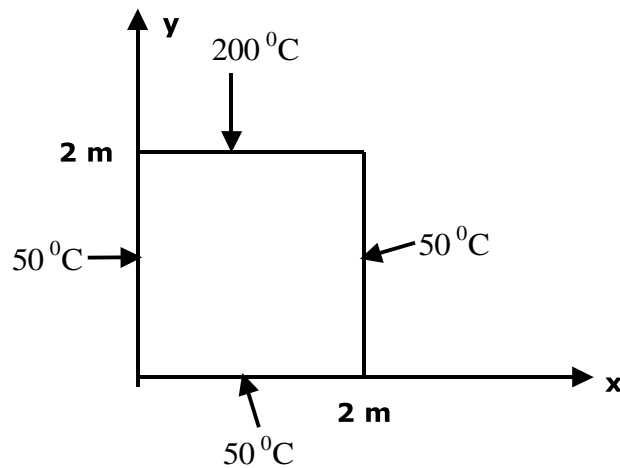


CANKAYA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING DEPARTMENT
ME 313 HEAT TRANSFER

Fall 2016

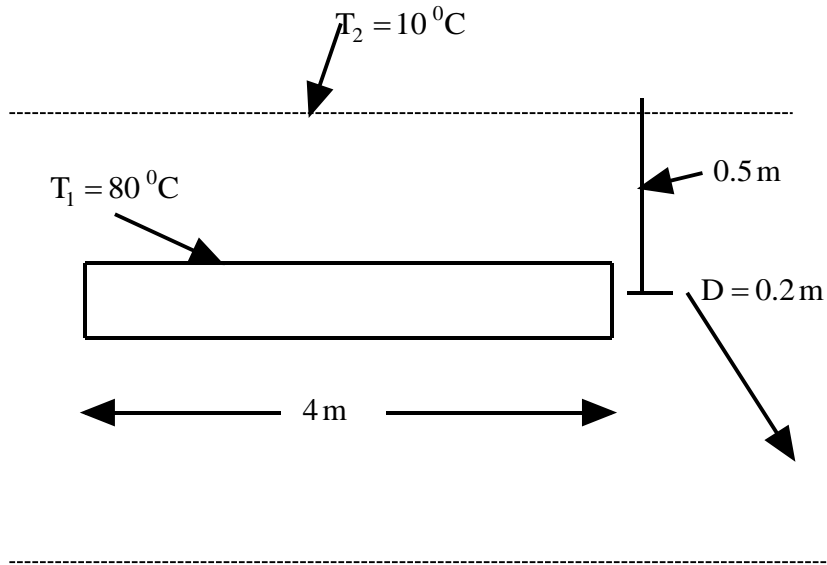
HW 4

1. Consider two dimensional problem show below,



Consider rectangular plate given in the figure. Calculate the temperature at the midpoint of the plate for the case in which $x=1$ m, $y=1$ m.

- 2) A horizontal pipe of 0.2 m in diameter and 4 m long is buried in earth at a depth of 0.5 m. The pipe wall temperature is 80 °C and the surface of earth is 10 °C. The thermal conductivity of the earth can be taken as 0.9 W/m.K . Calculate the heat lost by the pipe.



3) A spherical tank 0.5 m in diameter contains a radioactive material and the center of the sphere is buried in the earth ($k=0.8\text{ W/m K}$) at a depth of 1.25 m from the surface. The tank surface is maintained at a uniform temperature of 100°C as a result of radioactive decay; while the earth surface is at a uniform temperature of 10°C . Calculate the rate of heat generation in the tank.

4) P 4.29 of text book