

## AE/ME 339 Homework

1. For the one-dimensional heat conduction problem, write the implicit form of the equation for the left boundary node when the heat flux,  $\dot{q}_w = 2.04 \times 10^4 \text{ W/m}^2$   
You may follow the method used in writing the adiabatic wall boundary condition discussed in class.  
Material: aluminum. density,  $\rho = 2707 \text{ kg/m}^3$ , specific heat,  $c_p = 0.897 \text{ kJ/(kg K)}$ , thermal conductivity,  $k = 204 \text{ W/(m K)}$
2. Write the vector form of the equations for the following cases.
  - a. Three-dimensional inviscid flow
  - b. Two-dimensional viscous flow
  - c. Incompressible isothermal flow