

ME 201

Thermodynamics

Homework #10 Due Wednesday 2/22/06

1. Three of the processes that occur in the piston cylinder device of an internal combustion engine are:

Process 1: Constant pressure heat addition during which the volume doubles

Process 2: Isentropic expansion during which the volume increases 9 times

Process 3: Constant volume heat removal to a final pressure of 100 kPa

At the start of process 1 the engine contains 0.035 liters of air at 950 K and 5.7 MPa. For each of the three processes the air undergoes find the work and heat transfer in kJ. What is the total work and heat transfer for all three processes together?