These problems are due on Tuesday July 21.

1. The pressure and temperature at the beginning of compression of an air-standard Diesel cycle are 95 kPa and 300K. At the end of heat addition, the pressure is 7.2 MPa and the temperature is 2150 K. Determine
   a) the compression ratio
   b) the cutoff ratio
   c) the thermal efficiency
   d) the mean effective pressure (kPa)

2. Repeat problem 5 using the cold air standard with constant specific heats evaluated at 520R.

3. An air-standard dual cycle has a compression ration of 17 and a cutoff ratio of 1.2. At the beginning of compression, $P_1 = 95$ kPa and $T_1 = 310$ K. The pressure doubles during the constant volume heat addition process. Determine:
   a) the heat added at constant volume (kJ/kg)
   b) the heat added at constant pressure (kJ/kg)
   c) the net cycle work and thermal efficiency.

4. An ideal air-standard Brayton cycle has a compressor pressure ratio of 10. Air enters the compressor at 14.7 psia and 70F with a mass flow rate of 90,000lbm/hr. The turbine inlet temperature is 2200R. Determine:
   a) the cycle thermal efficiency
   b) the net power developed in hp.

5. Repeat problem 4, but consider that the compressor and turbine have isentropic efficiencies of 88% and 84%, respectively. Determine:
   a) the cycle thermal efficiency
   b) the back work ratio
   c) the net power developed in hp.
Homework #2 (cont).