

Mech 262: Thermodynamics 2 Assignment #1

Due Tuesday April 22nd

The following reheat-regeneration vapor power cycle uses both a closed and open feedwater heater. Steam enters the first turbine at 8.0 MPa, 450°C and expands to 0.8 MPa. The steam is reheated to 400°C before entering the second turbine. There, steam is bled into the open feedwater heater at 0.3 MPa. The rest of the steam eventually exits the fourth turbine stage at 7.5 kPa. The feedwater is heated up to 205°C before entering the boiler. The Net power output of the cycle is 100 MW. The pump efficiency is 80% while the turbine operates at 75%. Determine:

- a) the thermal efficiency, and
- b) the mass flow rate of the steam entering the first turbine in kg/h.
- c) draw the process on the T/s Diagram Provided

