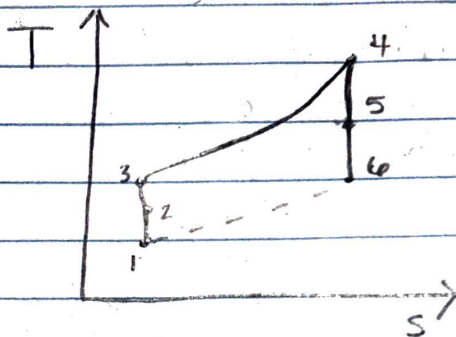
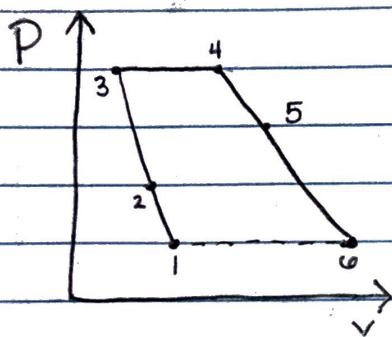


2. Purpose: To find pressure of gases at the exit of the turbine along with the air velocity at the nozzle exit, and finally the thrust for the engine if the inlet is 1.6 meters in diameter.

Drawings and Diagrams:



Sources:

Chapter 9 Gas Power Cycles: Jet Propulsion
Problem 9-143 and 9-142
Table A-17

Design Considerations

- Air assumptions for ideal gas ($R = 0.287 \text{ kJ/kg} \cdot \text{K}$)
- Constant pressure

Data and Variables

$$\begin{aligned} V_{\text{aircraft}} &= 900 \text{ km/h} \Rightarrow 250 \text{ m/s} & T_{\text{inlet turbine}} &= 1223.15 \text{ K} \\ P_1 &= 40 \text{ kPa} & W_c &= 500 \text{ kJ/kg} \\ T_1 &= 238.15 \text{ K} & \eta_c &= 0.87 & \eta_T &= 0.9 \\ D_{\text{inlet}} &= 1.6 \text{ m} \end{aligned}$$