GP

AE 5535 **Homework 3** **Assigned: 2/22/2021**
Due: 3/01/2021

Variable Area Turbojet Problem

Consider the performance of an ideal non-afterburning turbojet with flow at station 4 (turbine entrance) and station 8 (nozzle throat) choked. A4 is fixed and A8 is varied in order to maintain constant compressor total pressure ratio (π_C).

On-design conditions are as follows: $\pi_C = 15$ $M_0 = 2.0$ $\tau_\lambda = 7.0$

Find the required ratio of nozzle throat area (off-design) to nozzle throat area (on-design) for the engine operating at the same flight Mach number (2.0) but at the off-design condition such that τ_λ = 6.0.