as with the turbojet we will assume that the turbine and primary nozzle are both choked. This sets the turbine pressure ratio to be

$$\pi_t = \left(\frac{A_4}{A_8}\right)^{\frac{2\gamma}{\gamma+1}}$$

τ_t is known via isentropic relation

$$\tau_t = \pi_t^{\frac{\gamma-1}{\gamma}}$$

now look at turbofan solution

1) fuel consumption

$$f = \frac{\dot{m}_f}{\dot{m}_c} = \frac{c_p T_0}{h}\left(\tau_\lambda - \tau_r \tau_c\right) \quad (1)$$

$$\tau_r = 1 + \frac{\gamma-1}{2} M_0^2$$

$$\tau_c = \pi_c^{\frac{\gamma-1}{\gamma}}$$

so (1) is

need $\dot{m}_c$

$$F_1\left(\dot{m}_c, \tau_\lambda, \pi_c\right) = 0 \quad (1)$$

$\dot{m}_f$ is an input parameter