

MAE 150R
Rocket Propulsion Systems
Assignment 4: Due Monday, May 15, 2000
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HOMEWORK HINTS

3. b.) Use/show that

$$p_c = \left[\frac{A_b}{A_t} \frac{a(\rho_p - \rho_c)}{\sqrt{\frac{\gamma}{RT} \left(\frac{2}{\gamma+1}\right)^{\frac{\gamma+1}{\gamma-1}}}} \right]^{\frac{1}{1-n}}$$

c.) Use the information given:

$$\frac{d\left(\frac{A_b}{A_*}\right)}{dt} = 0.007 \left(\frac{A_b}{A_*}\right)$$

4. Use/show that

$$\frac{\dot{m}_2}{A_2} = \rho_2 u_2 = \sqrt{\frac{\gamma}{R}} \frac{p_{t2}}{\sqrt{T_{t2}}} M_2 \left(1 + \frac{\gamma-1}{2} M_2^2\right)^{-\frac{(\gamma+1)}{2(\gamma-1)}}$$

where

$$\dot{m}_2 = \rho_p r_b (\pi d L)$$

$$p_{t2} = p_c$$

$$T_{t2} = T_c$$