List of Answers

1. (c) $T(r) - T_o = \dfrac{\dot{Q} R_0^2}{4k} \left[1 - \left(\dfrac{r}{R_0} \right)^2 \right]$

2. (b) $q_0 = 1.8 l \sigma (T_1^4 - T_3^4)$

   (c) $q_R = 2.514 l \sigma (T_1^4 - T_3^4)$

   (d) $T_2 = (0.603 T_1^4 + 0.397 T_3^4)^{1/4}$

3. (d) $\tau_s \sim \left(\dfrac{\nu \, H}{g \, \beta \, \Delta T \, \alpha} \right)^{1/2}$

   (e) $\dot{m} = \dfrac{\rho \, g \, \beta \, \Delta T \, L^3}{12 \, \nu}$ and $\dot{Q} = \dot{m} c_p \, (T_2 - T_1)$

4. (b) $t = 6.78$days

   (c) $t = 27.11$days

   (d) $T = 987.3$K