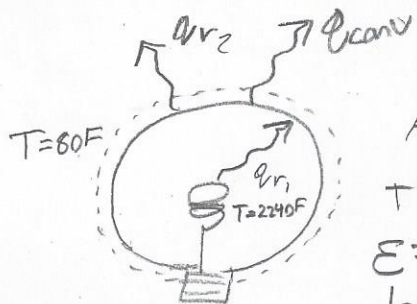


3



$$A = 2.5 \times 10^{-3} \text{ ft}^2$$

$$T = 2240 \text{ F}$$

$$\epsilon = 1$$

$$h = 1.17 \frac{\text{Btu}}{\text{hr ft}^2 \text{ F}}$$

$$d = 3''$$

$$A = 4\pi \left(\frac{d}{2}\right)^2$$

$$= 0.196$$

$$q_{r1} = \epsilon \sigma A (T_s^4 - T_\infty^4)$$

$$= 1 (.1714 \times 10^{-8}) (2.5 \times 10^{-3}) (2700^4 - T^4)$$

$$q_{r2} + q_{conv} = 0.1 q_r$$

$$q_{r2} = 1 (.1714 \times 10^{-8}) (.196) (T^4 - 540^4)$$

$$q_{conv} = 1.17 (T - 540)$$

$$1.17 (.196) (T - 540) + .1714 \times 10^{-8} (.196) (T^4 - 540^4) = 0.1 (.1714 \times 10^{-8}) (2.5 \times 10^{-3}) (2700^4 - T^4)$$

$$T = 588.2 \text{ R}$$

$$T = 128.2 \text{ F}$$