(Due Friday, Oct. 28 by 6pm in homework locker)

1. Consider the class AB output stage when \( V_{CC} = 9 \text{V} \), \( R_L = 10 \Omega \). Let \( Q_N \) and \( Q_P \) be matched with \( I_S = 10^{-14} \text{A} \) and \( \beta = 100 \). Design using a \( V_{BE} \) multiplier for a quiescent current \( I_Q = 1 \text{mA} \).

2. From a data sheet, a particular transistor can safely dissipate a maximum of 60W at a case temperature of 40°C. \( T_{JMAX} = 120°C \).
   (a) If it is connected to a heat sink using an insulating washer for which the thermal resistance is 0.5°C/W, what heat-sink temperature is necessary to ensure safe operate at 30W?
   (b) For an ambient temperature of 30°C, what heat-sink thermal resistance is required?
   (c) If, for a particular extruded-aluminum-finned heat sink, the thermal resistance in still air is 4.5°C/W per centimeter of length, how long a heat sink is needed?

3. Problems 9.1, 9.2

4. Exercise 9.3