The amplifier shown below is termed a bridge amplifier. The amplifier symbol with the -1 inside is an inverting amplifier with unity gain. The BJT characteristics are shown next to the circuit diagram.

\[ V_{s} \sin(\omega t) \]

\[ Q1 = Q2 = Q3 = Q4 \]

Beta = 100
\[ V_{A} = 100 \, V \]
\[ V_{CE, \, sat} = 0V \]
Max. junction temp.
\[ T_{j,\, max} = 125 \, ^{\circ}C \]
Max. ambient temp.
\[ T_{a,\, max} = 50 \, ^{\circ}C \]
Junction-to-case thermal resistance \[ R_{\theta,jc} = 1 \, ^{\circ}C/W \]

1. (0.5 points)
   Estimate the maximum average power the circuit can deliver to the 8 ohm load.

2. (1 point)
   What is the efficiency \((<P_{load}>/<P_{supplies}>)\) at maximum output signal swing?

3. (0.5 points)
   What should be the peak voltage rating and current rating of the transistors. Include a 50% factor of safety.

4. (1 point)
   What is the maximum average power dissipated in a transistor?

5. (1 point)
   The transistors are mounted next to each other on a common heat sink. Specify the required heat sink thermal resistance so that \( T_{j,\, max} \) is not exceeded when the ambient is at 50°C.