1. Classify the following singularities as removable, poles, or essential. If the singularity is a pole, state its order.
   (a) \( \frac{1}{(e^z - 1)} \) at \( z = 0 \)  
   (b) \( e^{1/z} \) at \( z = 0 \)  
   (c) \( \frac{z}{\sin z} \) at \( z = 0 \)

2. Find the residues of the following functions at the indicated points.
   (a) \( \frac{1}{(e^z - 1)} \) at \( z = 0 \)  
   (b) \( \frac{z^4}{(z - \frac{1}{6}z^3 - \sin z)} \) at \( z = 0 \)  
   (c) \( \frac{(z^2 + 1)}{z^4 - 1} \) at \( z = 1 \) and \( z = i \).

3. Find the residue of the function \( f(z) = \frac{1}{\sinh^2 z} \) at \( z = 0 \).