

**Exercise 2**

Show that

$$\begin{aligned} \text{(a)} \quad & \operatorname{Res}_{z=\pi i} \frac{z - \sinh z}{z^2 \sinh z} = \frac{i}{\pi}; \\ \text{(b)} \quad & \operatorname{Res}_{z=\pi i} \frac{\exp(zt)}{\sinh z} + \operatorname{Res}_{z=-\pi i} \frac{\exp(zt)}{\sinh z} = -2 \cos \pi t. \end{aligned}$$