**16.** Show that the special linear Lie algebra $\mathfrak{g} = \mathfrak{sl}_2\mathbb{C}$ has no ideals, except for the zero ideal $\{0\}$ and $\mathfrak{g}$ itself.

**17.** Let $\mathfrak{g}$ be the vector subspace in the general linear Lie algebra $\mathfrak{gl}_4\mathbb{C}$ consisting of all block matrices

$$A = \begin{bmatrix} X & Z \\ 0 & Y \end{bmatrix}$$

where $X, Y$ are any $2 \times 2$ matrices of trace zero, and $Z$ is just any $2 \times 2$ matrix.

(i) Check that $\mathfrak{g}$ is a Lie subalgebra in $\mathfrak{gl}_4\mathbb{C}$.
(ii) Show that the radical $\mathcal{R}(\mathfrak{g})$ of $\mathfrak{g}$ consists of all matrices $A$ where $X = Y = 0$.