SOLUTION of (2-14.b):

We rely on the very definition of linear independence from linear algebra. In particular, we have to show

$$\sum_{j=1}^{N} \alpha_j b_h^j(\boldsymbol{x}) = 0 \quad \forall \boldsymbol{x} \in \Omega \quad \Rightarrow \quad \alpha_j = 0 \quad \forall j \, .$$

This is easy, because choosing $\boldsymbol{x} := \boldsymbol{m}_k$, (2.14.1) already implies $\alpha_k = 0$, $k = 1 \ldots, N$.