1. Is the following set a subspace of $\mathbf{R}^3$?

$$\{(x, y, z) \in \mathbf{R}^3 \ : \ x + y = 0, \ z - 1 = 0\}$$

2. Explain why the following statements are false by giving counterexamples.

a) A spanning set of a subspace V is a basis of V.

b) If $V = \mathrm{span}\{u, v, w\}$, then $V = \mathrm{span}\{v, w\}$.