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3. Let  $S = \{f(x) : f(3) = 1\} \subseteq \mathbb{R}[x]$  be the set of all polynomials  $f(x)$  satisfying  $f(3) = 1$ . Determine, with justification, whether this is a vector space.

4. Determine, with justification, whether  $(1, 2)$  is in the row space of  $M = \begin{bmatrix} 2 & 3 \\ 6 & 9 \end{bmatrix}$ .

5. Set  $V = \mathbb{R}^3$ . Give any two subspaces  $U_1, U_2$  such that  $U_1 \oplus U_2 = V$ .