

1. Let $V = \{p \in P_2 \mid p(1) = 1\}$, where P_2 is the set of polynomials of degree 2 or less.
 - (a) Is V closed under addition?
No.
 - (b) Is V closed under scalar multiplication?
No.
 - (c) Is V a subspace of P_2 ?
No.
2. Let M_n be the set of all $n \times n$ matrices, where $n \geq 2$. Let $T : M_n \rightarrow \mathbb{R}$ be given by $T(A) = \det A$. Is T a linear transformation? Why or why not?
 T is not a linear transformation, since $T(2I) = 2^n T(I)$, rather than $2T(I)$.