

Name:

1. Let  $V = \{(x, y) \in \mathbb{R}^2 \mid x^2 - y^2 = 0\}$ .

(a) Is  $V$  closed under addition?

(b) Is  $V$  closed under scalar multiplication?

(c) Is  $V$  a subspace of  $\mathbb{R}^2$ ?

2. Let  $P_2$  be the set of all polynomials of degree 2 or less. Let  $T : P_2 \rightarrow \mathbb{R}$  be given by  $T(p(x)) = p(1)$ . Is  $T$  a linear transformation? Why or why not?