

T/F Four

**Mark each statement True or False. Justify each answer.**

1. The number of pivot columns of a matrix equals the dimension of its column space.
2. A plane in  $\mathbb{R}^3$  is a two-dimensional subspace of  $\mathbb{R}^3$ .
3. The dimension of the vector space  $\mathbb{P}_4$  is 4.
4. If a set  $\{\mathbf{v}_1, \dots, \mathbf{v}_p\}$  spans a finite-dimensional vector space  $V$  and if  $T$  is a set of more than  $p$  vectors in  $V$  then  $T$  is linearly dependent.
5. The number of variables in the equation  $A\mathbf{x} = 0$  equals the dimension of  $\text{Nul } A$ .
6. The only three-dimensional subspace of  $\mathbb{R}^3$  is  $\mathbb{R}^3$  itself.