

Name:

1. For each of the following statements, write the word “true” or “false.”

(a) Let $T : \mathbb{R}^2 \rightarrow M_{22}$ be defined by

$$T(a, b) = \begin{pmatrix} a & 1 \\ 1 & b \end{pmatrix}.$$

Then T is a linear transformation.

(b) Let A and B be two $n \times n$ matrices. Then $rk(AB) \leq rk(A)$.

2. Find a basis for the following subspace of P_4 .

$$S = \{f \in P_4 \mid f(1) = f'(0) = 0\}$$