

Name:

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

(a) Let $T : C[-2, 2] \rightarrow \mathbb{R}^2$ be defined by

$$T(f) = \begin{pmatrix} f(-1) \\ f(1) \end{pmatrix}.$$

Then T is a linear transformation.

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

2. Consider \mathbb{C}^2 as a vector space over \mathbb{R} . Find a basis for the following subspace of \mathbb{C}^2 .

$$S = \{(z_1, z_2) \in \mathbb{C}^2 \mid z_1 = \overline{z_2}\}$$