

Math 225 Quiz 2

Don't forget to write down clearly your **Name**:

and **Net ID**:

1. True or False (5 points) Mark "T" (True) or "F" (False) in front of each statement.

_____ If β is a generating set for V , then the number of elements in β must be greater than or equal to $\dim(V)$.

_____ Any basis for the space of 2×2 matrices contains 2 elements.

_____ A linear map $T : V \longrightarrow W$ must satisfy $T(0_V) = 0_W$.

_____ The kernel of a linear map $T : V \longrightarrow W$ is a subspace of W .

_____ Any linear map $T : \mathbb{R}^3 \longrightarrow \mathbb{R}^4$ is injective.

2. Compute the matrix (5 points). Consider the linear operator

$$T := \frac{d^2}{dx^2} - 2\frac{d}{dx} : P_{\leq 3}(\mathbb{R}) \longrightarrow P_{\leq 2}(\mathbb{R}).$$

Find the matrix for T with respect to the standard monomial basis for the spaces.