Advanced Linear Algebra 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. Isomorphism (5 points). Is the linear map

$$T = \frac{d}{dx} : P_5(\mathbb{R}) \longrightarrow P_5(\mathbb{R}), \quad f(x) \mapsto f'(x)$$

an isomorphism? Justify your answer.