Quiz 6

Name:

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1. Which of the following vector spaces are isomorphic? Group them accordingly and provide your rationale.

$$\mathbb{R}^8 \qquad \mathcal{M}_{3\times 3} \qquad \mathcal{P}_8 \qquad \mathbb{R}^7 \qquad \mathcal{M}_{4\times 2} \qquad \mathbb{R}^9 \qquad \mathcal{P}_7$$

2. Define the map $T\colon \mathbb{R}^3 \to \mathbb{R}^2$ by $T\left(\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}\right) = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$.

(a) Verify that T is a homomorphism:

(b) Why is T not an isomorphism?

(c) Identify one easy way to change T to make it an isomorphism.