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# Unit 7 - Week 5



# Assignment 5 - Objective

**The due date for submitting this assignment has passed. Due on 2020-04-01, 23:59 IST.**
**As per our records you have not submitted this assignment.**

1) For every $n \in \mathbb{Z}^+$, let ***1 point***
$\mathcal{P}_n = \{f(X) = a_0 + a_1 X + \cdots + a_n X^n : a_0, a_1, \ldots, a_n \in \mathbb{R}\}$.
Define $T : \mathcal{P}_3 \to \mathcal{P}_5$ as
$T(f(X)) = \int_0^X \int_0^Y f(U)\, dU\, dY$, for all $f(X) \in \mathcal{P}_3$.
State whether True or False. $T$ is a linear map.

- True
- False

No, the answer is incorrect.
Score: 0
Accepted Answers:
*True*

2) State whether True or False. $\mathbb{R}^3$ with the usual inner product has a unique orthonormal basis. ***1 point***

- True
- False

No, the answer is incorrect.
Score: 0
Accepted Answers:
*False*

3) Let $\{u_1, u_2, u_3\}$, $\{v_1, v_2, v_3\}$ be two orthonormal bases of $\mathbb{R}^3$ with the usual inner product. Let $U = \begin{bmatrix} u_1 & u_2 & u_3 \end{bmatrix}$ and $V = \begin{bmatrix} v_1 & v_2 & v_3 \end{bmatrix}$. Suppose there exists a $3 \times 3$ matrix $A$ such that $U = AV$. Then ***1 point***

- $A$ is a symmetric matrix.
- $A$ is an invertible matrix.
- $A$ is a diagonal matrix.
- $A$ is the identity matrix.

No, the answer is incorrect.
Score: 0

Accepted Answers:
*$A$ is an invertible matrix.*