Problem 17.

Find the coordinate vectors for p relative to the basis

in ;

where ;

,

,

[1] Find the scalars a, b and c such that:

Thus,

[2] Solve system of linear equations

[3] Coordinate vector

Problem 18. Discuss how the rank of A varies with t:

[1] Gaussian elimination

Forward Elimination

-------------------------------------------------------- iter: 1

R2: R2 - R1

-------------------------------------------------------- iter: 2

R3: R3 - tR1

-------------------------------------------------------- iter: 3

R3: R3 – R2

[2] Rank

Problem 18. Discuss how the rank of A varies with t:

[1] Gaussian elimination

Forward Elimination

-------------------------------------------------------- iter: 1

R2: R2 − tR1

-------------------------------------------------------- iter: 2

R3: R3 − 3R1

-------------------------------------------------------- iter: 3

R3: R3 –(3R2/(3-t))

[2] Rank

Thus,

*Problem 19. Let U and V be two subspaces of R4 defined by*

*And*

*Find the dimensions of U and V .*

[1] Subspace U:

Any vector in U can be expressed as:

and

[2] Basis vectors for U

Thus

[1] Subspace V:

Any vector in U can be expressed as:

[2] Basis vectors for U

Thus

*Problem 20.*