**Department of Mathematics**

**College of Sciences**

**King Saud University**

**Math 246**

**Second Midterm exam**

**First semester, 1435-1436H**

**Time: 90 Min**

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| **Name:** |
| **Student No.** |

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| --- | --- | --- | --- | --- | --- | --- |
| **Question number** | I  | II | III | IV | V | Total |
| **Answer** |  |  |  |  |  |  |

**I.** Find a subset of the vectors that forms a basis for the space spanned by these vectors v1 = ( 1 , 0 , 1 ) v2 = ( -3 , 3 , 7 ) v3 = ( -1 , 3 ,9)

**II.** Let 

(a) Prove that W is a subspace of R3.

(b) Find a basis of W.

**III.** Let V be an n dimentional space and let S be a subset of V with n vectors. Prove that if S spans V then S is a basis of V.

**VI**. Find the eigenvalues of A = .

**V**- (a) Let



Knowing that the Eigen values of A are 1 and 4:

1. Find the Eigen space that corresponds to each of the Eigen values.
2. Prove that A is diagonalizable, find P such that P-1AP is diagonal.
3. Find P-1AP.