Quiz N°1 Math 302_131 (October 01, 2013)

KFUPM **Semester 131**

Dept. Math. &Stat. **A.Y:2013/2014**

Name: .....

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Exercise 1. Show that

$$S = \{(x, y, z) \in \mathbb{R}^3 : x - 2y + z = 0\}$$

is a subspace of $\mathbb{R}^3$ and find the dimension of S.

Exercise 2. Use Gauss-Jordan Reduction to solve the following system.

$$\begin{aligned} x + y - 2z &= -2 \\ y + 3z &= 7 \\ x - z &= -1 \end{aligned}$$

Exercise 3. Find the rank of the following matrix A:

$$\begin{pmatrix} 2 & 0 & 3 & 4 \\ 0 & 1 & 1 & -1 \\ 3 & 1 & 0 & 2 \\ 1 & 0 & -4 & -1 \end{pmatrix}$$

and evaluate the dimension of the solution space of the homogeneous system $AX = O$.

Exercise 4.

(a) Find the inverse of the following matrix A by using the Gauss-Jordan Method

$$\begin{bmatrix} 1 & 2 & 4 & 6 \\ 0 & 1 & 2 & 0 \\ 0 & 0 & 1 & 2 \\ 0 & 0 & 0 & 2 \end{bmatrix}$$

(b) Use the inverse of A to solve the system

$$AX = \begin{pmatrix} \\ 1 \\ 2 \\ 3 \\ 4 \end{pmatrix}$$