

Midterm Exam II

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Last Name: _____

First Name: _____

ID: _____ Section: _____

Math 2243,
March 24, 2004

**There are 4 partial credit questions, each of them worth 25 points.
NO GRAPHIC CALCULATORS are permitted. GOOD LUCK !**

1. Answer both of the following two questions :

- a) Give an example of two square matrices A and B such that $AB \neq BA$
- b) Find a nonzero matrix (a matrix for which not all the entries are zero) that satisfies the equality $A^2 = 0$.

2. Let $V = \{(x, y, z) \in R^3 \mid x + y - z = 0\}$. Find an orthonormal basis in V .

3. Consider the following subset of R^3

$$S = \{(x, y, z) \in R^3 \mid y^2 - xz = 0\}.$$

Is S a vector subspace of R^3 ? What is the span of this subset?

4. Let $f(t) = t$, $g(t) = e^t$ and $h(t) = t^3$. Are these three functions linearly independent? Is $l(t) = t^2$ in the subspace generated by f, g and h ?