Name————————————————————, **ID** ————————————

Quiz 1, MTH 221, Spring 2015

Ayman Badawi

QUESTION 1. Let $A = \begin{bmatrix} 2 & 4 & -2 \\ 0 & 2 & 2 \\ -2 & -2 & 0 \end{bmatrix}$ and let $B = \begin{bmatrix} 1 & -1 & 4 \\ 0 & 4 & -1 \\ 2 & 2 & 0 \end{bmatrix}$.

(i) Find a symmetric matrix F and a skew-symmetric matrix D such that $A = F + D$.

(ii) Find the entries of the second column of the matrix $C = AB$ using linear combination of columns.

(iii) Find the entries of the third row of $L = BA$ using linear combination of rows.

QUESTION 2. Solve for x_1, x_2, x_3 using the AUGMENTED method (you may finish your solution on the back)

$$x_1 + x_3 = 5$$
$$-2x_1 + x_2 + 2x_3 = 7$$
$$3x_1 - x_2 + 4x_3 = 18$$

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Quiz 2, MTH 221, Spring 2015

Ayman Badawi

QUESTION 1. Given the augmented matrix of a system of linear equations: $A = \begin{bmatrix} 0 & 1 & 4 & -2 & 5 \\ 1 & -1 & -4 & 3 & -4 \\ -2 & 2 & 8 & -5 & 6 \end{bmatrix}$. Find the solution set of the system.

QUESTION 2. Given the augmented matrix of a system of linear equations: $\begin{bmatrix} 0 & 1 & 4 & -7 \\ a & -1 & -3 & 9 \\ 0 & -1 & b & 7 \end{bmatrix}$.

(**USE THE BACK PAGE**)

(i) For what values of a, b will the system be consistent?

(ii) For what values of a, b will the system have unique solution?

(iii) For what values of a, b will the system have infinity many solution?

(iv) For what values of a, b will the system be inconsistent?

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Quiz 3, MTH 221, Spring 2015

Ayman Badawi

QUESTION 1. Given a 4×4 matrix A such that $A^{-1} = \begin{bmatrix} 2 & 3 & 0 & 1 \\ -2 & -2 & 1 & 1 \\ -4 & -6 & 1 & 1 \\ -2 & -3 & 0 & 4 \end{bmatrix}$. Find the solution set for the system of linear equations $AX = \begin{bmatrix} 5 \\ -4 \\ -10 \\ -5 \end{bmatrix}$.

(**If you wish you may finish your calculation on THE BACK PAGE**)

QUESTION 2. Let $A = \begin{bmatrix} 1 & 0 & 0 & -2 \\ -1 & 1 & 0 & 2 \\ -1 & 0 & 0 & 3 \\ -2 & 0 & 1 & 4 \end{bmatrix}$. Find A^{-1} if possible.

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Quiz 4, MTH 221, Spring 2015

Ayman Badawi

QUESTION 1. Let A $\overrightarrow{2R_1,\ 3R_3}$ $B = \begin{bmatrix} 2 & 4 \\ 1 & 5 \\ 6 & 9 \end{bmatrix}$ $\overrightarrow{-R_1 + R_3 \to R_3}$ C $\overrightarrow{R_1 \leftrightarrow R_2}$ D.

(i) Find elementary matrices F_1, F_2, F_3 such that $F_1F_2F_3A = C$.

(ii) Find elementary matrices K_1, K_2 such that $K_1K_2D = B$.

(iii) Find the matrix A.

QUESTION 2. Let $A = \begin{bmatrix} 7 & 5 \\ -2 & 10 \end{bmatrix}$. If possible, find A^{-1}.

QUESTION 3. For what values of a will the matrix $\begin{bmatrix} a & -7a \\ 3 & a \end{bmatrix}$ be invertible?

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Quiz 5, MTH 221, Spring 2015

Ayman Badawi

QUESTION 1. Given A, B are 4×4 matrices such that $det(A) = -2$ and $det(B) = 0.5$. Find

a) $det(A^{-1}B^T)$ =

b) $det(2B)$ =

c)$det(0.5A^2)$ =

QUESTION 2. Let $A = \begin{bmatrix} 7 & 5 & 1 \\ -2 & 1 & 0 \\ 4 & 0 & 2 \end{bmatrix}$. Use the definition of determinant to find $det(A)$.

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Quiz 7, MTH 221, Spring 2015

Ayman Badawi

QUESTION 1. 1) Let $F = \{A \in R^{2\times 2} \mid det(A) = 0\}$. Is F a subspace of $R^{2\times 2}$? I say NO. Justify my answer or prove me wrong!

2)Let $M = \{f(x) \in P_3 \mid f(-2) = 0\}$. Convince me that M is a subspace of P_3.

3) Are $(1, -1, 2, 0), (-1, 1, -2, 5), (2, -2, 4, 5)$ independent? explain

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Quiz 8, MTH 221, Spring 2015

Ayman Badawi

QUESTION 1. 1) Let $F = \left\{ A \in R^{2\times 2} \quad | \quad A^2 = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} \right\}$. Is F a subspace of $R^{2\times 2}$? I say NO. Justify my answer or prove me wrong!

2)Let $M = \{f(x) \in P_3 \quad | \quad f(-2) = 0 \ \ OR \ \ f(0) = 0\}$. Convince me that M is not a subspace of P_3.

3) Let $D = \{3x^2 + x - 1, -3x^2 + 4, -6x^2 + x + 9\}$. Find $dim(D)$. Give me two different basis for D

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Quiz 9, MTH 221, Spring 2015

Ayman Badawi

QUESTION 1. Let $A = \begin{bmatrix} 3 & 2 & 5 \\ 0 & 5 & 1 \\ 0 & 0 & -2 \end{bmatrix}$

(i) Find $C_A(x)$ and the eigenvalues of A.

(ii) For each eigenvalue a of A find E_a and write it as a span of some basis.

(iii) Is A diagnolizable? If yes find a diagonal matrix D and an invertible matrix W such that $W^{-1}AW = D$.

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