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Notes before solving the exam:

1) You have to solve the recommended problems in the book after understanding each chapter from the book and the

2) If you have any questions or concerns, let us know through our mail: insightclub@gmail.com.

GOOD LUCK:)

October 9, 2017

Time: 55 minutes

Fall 2017-18

MATHEMATICS 218 QUIZ I

NAMI ID#

Circle your section number:

Hazar Abu-Khuzam			Sabine El Khoury			Sabine El Khoury			Michella Bou Eid		
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GRADE PROBLEM

PART I



PART II

5	6	7	8	9	10	11
a	a	a	a	a	a	a
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PART III

12	13	14	15	16	17	18
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12-18 - ____ / 21

TOTAL

100/100

PART I. Answer each of the following problems in the space provided for each problem (Problem 1 to Problem 4).

1. Find the values of a and b for which the following system

$$x + y + z = b$$

$$-3x - 3y + az = 8$$

$$2x + y + z = 1$$



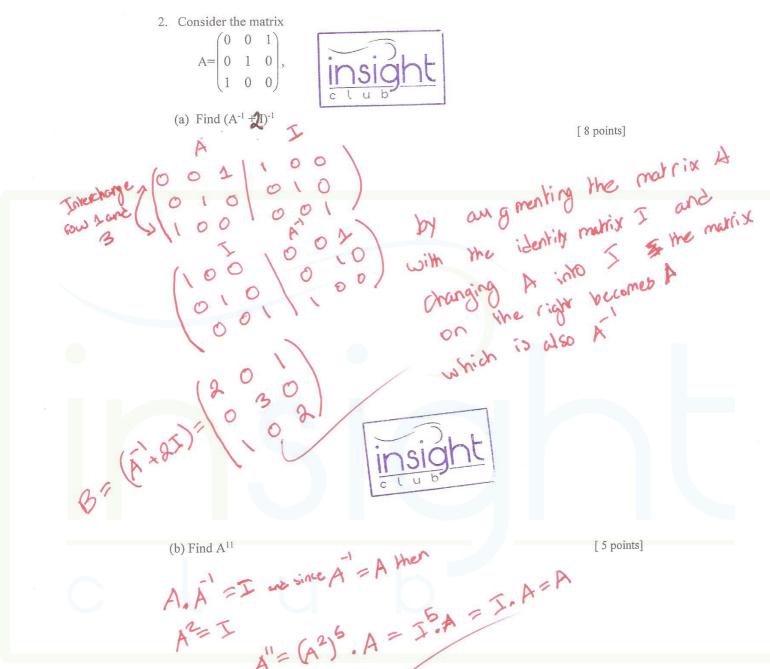
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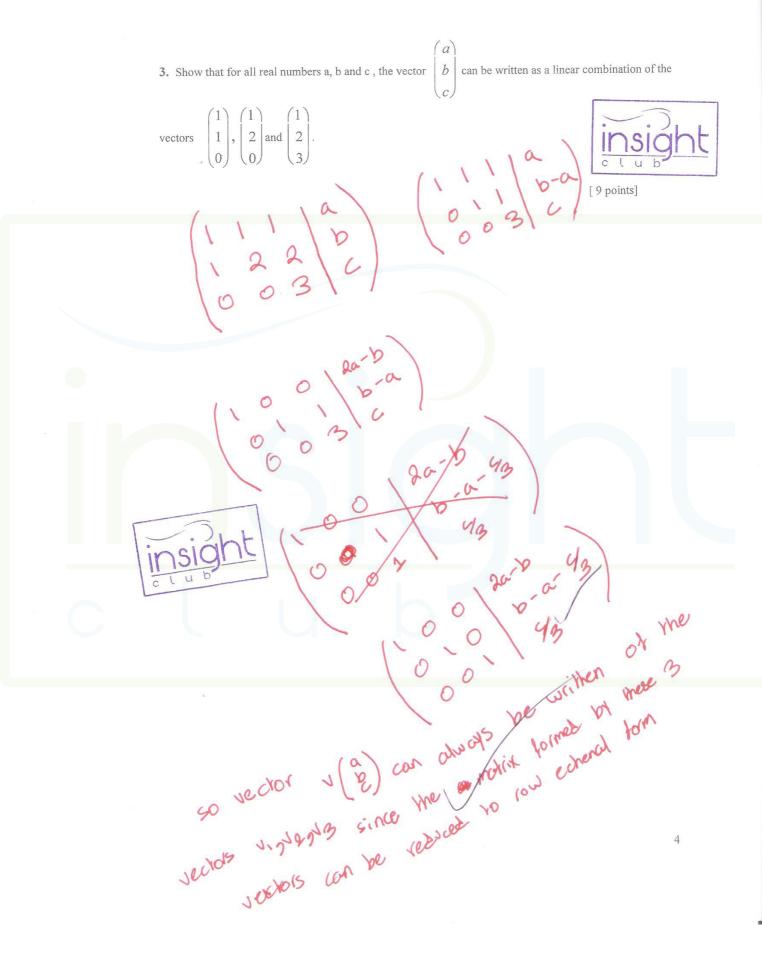
- a. no solution
- b. a unique solution
- c. infinitely many solutions.

[14 points]

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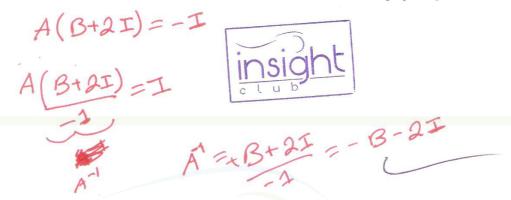
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- 4. Let A and B be 2×2 matrices such that AB+2A = -I.
 - (a) Find an expression of A-1 in terms of B

[8 points]



(b) Suppose that the above matrices A and B are given to be $A = B = \begin{pmatrix} a & 0 \\ 0 & a \end{pmatrix}$ for some nonzero number a. Find all possible values of a.

[7 points]

$$AB = \begin{pmatrix} a & 0 \\ 0 & a \end{pmatrix} \begin{pmatrix} a & 0 \\ 0 & a \end{pmatrix} = \begin{pmatrix} a^{2} & 0 \\ 0 & a^{2} \end{pmatrix}$$

$$AB + 2A + 3 = \begin{pmatrix} a^{2} + 2a & 0 \\ 0 & a^{2} + 2a \end{pmatrix}$$

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PART II. Circle the correct answer for each of the following multiple choice problems (Problem 5 to Problem 11) IN THE TABLE IN THE FRONT PAGE. [4 points for each correct answer].

- 5. Let A be a 3×3 matrix such that $A^2 = A$. Then,
 - a. A is invertible
 - b. det(A) = 0
 - c. A = I
 - $A^5 = A^2$
 - None of the above.

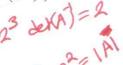


If A and B are invertible 3×3 matrices such that

$$\det(2A^{-1}) = 2 = \det(A^{3}(B^{-1})^{t})$$

Then,

- a. $\det(B)=1/2$
- b. $\det(B) = 2$
- (c.) det (B)= 32
- det (B)= 8
- None of the above.



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7. Which one of the following statements is TRUE?



- a. If AB = AC, then B = C.
- b. If AB = 0 then A = 0 or B = 0.
- c. If A is invertible then Ax = x has only the trivial solution for x.
- (d) If b can be written as a linear combination of the columns of A then AX = b is consistent.

[4 points]

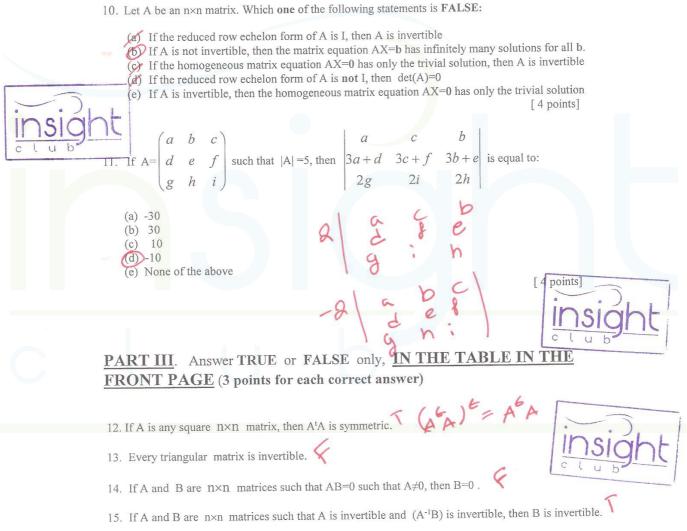
- 8. Let A be an invertible n×n matrix. Which one of the following statements is FALSE:
 - At is invertible.
 - The number of nonzero rows in a row echelon form of A is n.
 - AB is invertible for any n×n matrix B.
 - $\det(A) \neq 0$.
 - The reduced row echelon form of A is I.

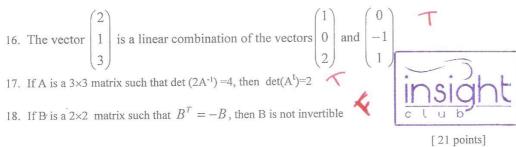
[4 points]



9. Let v_1, v_2, v_3, v_4 , and v_5 be vectors in \mathbb{R}^n such that $v_3 = v_1 + v_2$, and $v_5 = v_3 + v_4$. Which one of the following statements is **FALSE**:

(a) v_5 is a linear combination of $v_1, v_2, v_3 = v_4 + v_4 = v_5 + v_5 + v_5 + v_5 = v_5 + v_5 + v_5 + v_5 + v_5 + v_5 = v_5 + v_5$





 $\frac{2^{3}}{1} = 4$ (A) = 2 0 = 0