**Math 210. Assignment #1.**

Due: Feb 8 – section 1; Feb 9 – section 2

**Instructions**: For full marks, you must provide complete solutions in the space provided. ***Questions 8 - 11 should be done with SCILAB and the printed output should be attached to this assignment.***

***Late assignments will not be accepted****.*

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**1. Solve the following system of equations using the following theorem**

**().**

**/4**

**2. For the following matrix, find:**

**/4**

a) The inverse; a)

b) The 4th power.

b)

**3. Find the inverse of the following matrix by using row operations technique.**

**/5**

**4. Find A given the following:**

**/3**

**5. Find all values for m and n for which matrix A and B are both not invertible (at the same time):**

**/3**

**6. If A, B, C are invertible matrices, simplify the following expression using algebraic properties of matrices (Hint: Your answer should contain only one term).**

**/3**

**7. Solve the system associated with the matrix below:**

**/4**

**8. Consider the following matrices:**

A = ; B = ; C = ; D =

Perform the following operations ***using SCILAB***:

**/6**

a) AB

-->A\*B

ans =

- 1. - 1. 0.

7. 6. 7.

- 2. 5. 35.

b)

-->A'-4\*B

ans =

- 10. - 4. 20.

0. - 1. - 13.

- 29. - 11. 30.

c)

-->C^3

ans =

8. - 9.

15. 26.

d) inv(A)

-->inv(A)

ans =

0.9285714 0.5 - 0.2142857

- 0.2857143 0. 0.1428571

0.8571429 1. - 0.4285714

e) inv (AB)

-->inv(A\*B)

ans =

2.0833333 0.4166667 - 0.0833333

- 3.0833333 - 0.4166667 0.0833333

0.5595238 0.0833333 0.0119048

f)

-->B^-1\*A^-1

ans =

2.0833333 0.4166667 - 0.0833333

- 3.0833333 - 0.4166667 0.0833333

0.5595238 0.0833333 0.0119048

**Solve the following system of equations *using SCILAB:***

**/2**

-->A=[2 3 4 -1 2; 3 7 -2 1 2; 4 5 7 10 1; 0 3 -2 1 2]

A =

2. 3. 4. - 1. 2.

3. 7. - 2. 1. 2.

4. 5. 7. 10. 1.

0. 3. - 2. 1. 2.

-->rref(A)

ans =

1. 0. 0. 0. - 1.2920354

0. 1. 0. 0. 0.9690265

0. 0. 1. 0. 0.3849558

0. 0. 0. 1. - 0.1371681

**10. Solve the following system simultaneously (*using SCILAB*):**

**/2**

1. ; ;
2. ; ;

-->A=[1 3 5 1 0; -1 -2 0 0 1; 2 5 4 -1 1]

A =

1. 3. 5. 1. 0.

- 1. - 2. 0. 0. 1.

2. 5. 4. - 1. 1.

-->rref(A)

ans =

1. 0. 0. 18. - 23.

0. 1. 0. - 9. 11.

0. 0. 1. 2. - 2.

**11. Using Scilab, decode the following message:**

39; 18; 29; 10; 55; 36; 3; 2; 33; 14; 11; 4; 21; 2

Knowing that the encoding matrix was:

Use the same letter – number correspondence as used in class.

**/4**

-->X=[39 18; 29 10; 55 36; 3 2; 33 14; 11 4; 21 2]

X =

39. 18.

29. 10.

55. 36.

3. 2.

33. 14.

11. 4.

21. 2.

-->B=[1 0; 3 2]

B =

1. 0.

3. 2.

-->A=X\*B^-1

A =

12. 9.

14. 5.

1. 18.

0. 1.

12. 7.

5. 2.

18. 1.

12 9 14 5 1 18 0 1 12 7 5 2 18 1

L I N E A R A L G E B R A