

CU Boulder

Math 2130

Sample-Test 1

Section 002 (Instructor Farid AliniaEIFARD)

NAME (print): _____
(Family) (Given)

SIGNATURE: _____

STUDENT NUMBER: _____

Instructions:

1. Time allowed: 50 minutes.
2. NO CALCULATORS OR OTHER AIDS
3. There are 5 questions on 5 pages. Last page is blank.
4. Questions can be solved in more than one way.
5. You are expected to write clearly and carefully. You will be graded for both content and presentation.

Question	Points	Marks
1	5	
2	5	
3	5	
4	5	
5	5	
Total	25	

First Midterm

1. (5 points) Let

$$\begin{array}{rcccc} & +3x_2 & -x_3 & = & 1 \\ x_1 & -2x_2 & +6x_3 & = & 0 \\ 2x_1 & -x_2 & +11x_3 & = & 1 \end{array}$$

Is the system consistent? if so write the solution set.

2. (5 points)

(a) Find a basis for

$$V = \text{span} \left\{ \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} -1 \\ 1 \\ -1 \end{bmatrix}, \begin{bmatrix} 0 \\ 3 \\ 2 \end{bmatrix} \right\}$$

(b) Is $b = \begin{bmatrix} 0 \\ 6 \\ 4 \end{bmatrix}$ in V ?

3. (5 points)

(a) Show that

$$T(x_1, x_2, x_3) = 3x_2 - x_1 + x_3$$

is a linear transformation.

(b) Find the standard matrix for T .

4. (5 points)

- (a) Let B be the coefficient matrix of the linear system in question 1. Find a basis for $ColB$. What is $rankB$?
- (b) Find a basis for $NulB$. What is the dimension of $NulB$.

First Midterm

5. (5 points) The last question will be True or False question.

First Midterm

The end. Have a great weekend