

Math 20F
Midterm Exam 1
January 28, 2014
...
Version A

Instructions

1. No calculators or other electronic devices are allowed during this exam.
 2. You may use one page of notes, but no books or other assistance during this exam.
 3. Write your *Name*, *PID*, and *Section* on the front of your Blue Book.
 4. Write the *Version* of your exam on the front of your Blue Book.
 5. Write your solutions clearly in your Blue Book
 - (a) Carefully indicate the number and letter of each question and question part.
 - (b) Present your answers in the same order they appear in the exam.
 - (c) Start each question on a new side of a page.
 6. Read each question carefully, and answer each question completely.
 7. Show all of your work; no credit will be given for unsupported answers.
0. (1 point) Carefully read and complete the instructions at the top of this exam sheet and any additional instructions given during the exam.
1. (6 points) Determine if the following system is consistent. Do not completely solve the system.

$$\begin{array}{rccccrcr} x_1 & & & + & 3x_3 & & = & 2 \\ & & x_2 & & & - & 3x_4 & = & 3 \\ & - & 2x_2 & + & 3x_3 & + & 2x_4 & = & 1 \\ 3x_1 & & & & & + & 7x_4 & = & -5 \end{array}$$

2. (6 points) Determine if \mathbf{b} is a linear combination of the vectors formed from the columns of the matrix A .

$$A = \begin{bmatrix} 1 & -4 & 2 \\ 0 & 3 & 5 \\ -2 & 8 & -4 \end{bmatrix}, \quad \mathbf{b} = \begin{bmatrix} 3 \\ -7 \\ -3 \end{bmatrix}$$

3. (6 points) Find the value of h for which the set of vectors

$$\begin{bmatrix} 1 \\ -1 \\ -2 \end{bmatrix}, \begin{bmatrix} -2 \\ 3 \\ 5 \end{bmatrix}, \begin{bmatrix} 5 \\ -4 \\ h \end{bmatrix}$$

is linearly *dependent*. Justify your answer.

4. (6 points) Determine the solution set of the following linear system.

$$\begin{array}{rccccrcr} x_1 & - & 2x_2 & + & 2x_3 & + & x_4 & = & 6 \\ & & x_2 & + & 3x_3 & + & 2x_4 & = & 8 \\ x_1 & - & 3x_2 & - & x_3 & + & x_4 & = & 4 \end{array}$$