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**Cover Sheet for 2014-2015 Fall Semester MATH 3200/5200 (Barsamian) Homework 2**  
**(Due at the start of class Friday, September 5, 2014. Staple this cover sheet to the front of your work.)**

<b>Problem:</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Total</b>	<b>Rescaled</b>
<b>Your Score:</b>							
<b>Possible:</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>100</b>	<b>10</b>

**Reading:** In Chapter One, read Sections I.3, pages 22 – 32 and II.1, pages 34 – 40 and II.2, pages 41 - 46

**Suggested Exercises:** (These nineteen exercises are not to be turned in and are not graded, but you should do as many of them as possible and keep your solutions in a notebook for study. Note that detailed solutions to all of the Suggested Exercises are available in the solutions manual provided for free on the author’s web site.)

Section One.I.3 Exercises # 14, 16, 17, 19, 20 (from pages 32 - 33)

Section One.II.1 Exercises # 1, 3, 4, 6, 7, (from pages 40 - 41)

Section One.II.2 Exercises # 11, 12, 14, 15, 23, 25, 30, 35, 38 (from pages 46 - 48)

**Assigned Exercises:** Turn in your solutions to the following five exercises, with this cover sheet stapled to the front of your work.

**[1] (20 points)** (Similar to One.I.3#14) On Homework 1, you solved the four systems below. Now, express the solution set for each system using vectors. Identify the particular solution and the solution set of the homogeneous system.

$$(a) \begin{cases} 2x + 3y = 3 \\ x - y = 4 \end{cases} \quad (b) \begin{cases} 2x + 3y = 3 \\ 4x + 6y = 5 \end{cases} \quad (c) \begin{cases} x - y - z = 1 \\ 4x - 2y - z = 5 \end{cases} \quad (d) \begin{cases} 2x + z = 3 \\ x - y - z = 1 \\ 3x - y = 4 \end{cases}$$

**[2] (20 points)** (Similar to One.I.3#16) For the system  $\begin{cases} x + 2y - z + 3w = 2 \\ 2x + 4y - z + 6w = 5 \\ y + 2w = 3 \end{cases}$

which of the vectors shown at right can be used as the particular solution part of some general solution?

Show all steps clearly and explain clearly.

$$(a) \begin{pmatrix} -3 \\ 3 \\ 1 \\ 0 \end{pmatrix} \quad (b) \begin{pmatrix} -1 \\ -1 \\ 1 \\ 3 \end{pmatrix} \quad (c) \begin{pmatrix} -1 \\ -1 \\ 1 \\ 2 \end{pmatrix}$$

**[3] (20 points)** (Similar to One.I.3#17) Lemma 3.7 says that we can use any particular solution for  $\vec{p}$ .

Find, if possible, a general solution to this system  $\begin{cases} x + 2y + 2w = 6 \\ 3x + 5y - z + 6w = 17 \\ 2x + 4y + z + 2w = 12 \end{cases}$

that uses the given vector at right as its particular solution.

Show all steps clearly and explain clearly.

$$(a) \begin{pmatrix} 6 \\ -1 \\ 2 \\ 1 \end{pmatrix} \quad (b) \begin{pmatrix} 4 \\ 1 \\ 0 \\ 0 \end{pmatrix} \quad (c) \begin{pmatrix} 10 \\ -5 \\ 6 \\ 2 \end{pmatrix}$$

**[4] (20 points)** (Similar to One.I.3#19) Singular or nonsingular? Show all steps clearly and explain clearly.

$$(a) \begin{pmatrix} 1 & 2 \\ 2 & 1 \end{pmatrix} \quad (b) \begin{pmatrix} 1 & 2 \\ 3 & 6 \\ 5 & 10 \end{pmatrix} \quad (c) \begin{pmatrix} 1 & 2 \\ 0 & 0 \end{pmatrix} \quad (d) \begin{pmatrix} 4 & 5 & 1 \\ 1 & 0 & 5 \\ -1 & 1 & 2 \end{pmatrix} \quad (e) \begin{pmatrix} 2 & -1 & 3 \\ -1 & 4 & 2 \\ 0 & 7 & 7 \end{pmatrix}$$

**[5] (20 points)** (Similar to One.I.3#20) Is the vector  $\begin{pmatrix} 12 \\ -7 \\ 5 \end{pmatrix}$  in the set generated by the set  $\left\{ \begin{pmatrix} 2 \\ 0 \\ 3 \end{pmatrix}, \begin{pmatrix} 1 \\ -5 \\ 7 \end{pmatrix}, \begin{pmatrix} 4 \\ 1 \\ -2 \end{pmatrix} \right\}$ ?

Show all steps clearly and explain clearly.