1S2 (Timoney) Tutorial/exercise sheet 1 [October 22– 26, 2007]

Please try to do these problems now. We can discuss them in the tutorials when they are get organised, but once we get tutorials properlt underway a new (short) list of problems will be given to you at each tutorial (to be handed in at the end of the tutorial).

If you can do most of these questions before the tutorial, you can ask for help with any that puzzle you during the first tutorial. Then you should be ready to hand in your efforts at the end of the tutorial. Put your name and student ID on your work.

1. Write an augmented matrix corresponding to the following system of linear equations:

 $5x_1 - 2x_2 + x_3 - 4x_4 = -3$ $2x_1 + 3x_2 + 7x_3 + 2x_4 = 18$ $-x_1 - 12x_2 - 11x_3 - 16x_4 = -37$ $x_1 + 2x_2 - x_3 - x_4 = -3$

2. Write out a system of linear equations (in the unknowns x_1 , x_2 and x_3) corresponding to the augmented matrix:

1	0	-1	:	5]
-2	1	4	:	3
0	5	2	:	1

- 3. Use Gaussian elimination followed by back-substitution to solve the system of equations corresponding to the augmented matrix of the previous question.
- 4. Use Gauss-Jordan elimination to solve the system of equations corresponding to same augmented matrix (of the previous two questions).
- 5. Use Gauss-Jordan elimination to describe all solutions of the following system of linear equations:

 $5x_1 - x_2 - x_3 - 8x_4 = 5$ $10x_1 - 2x_2 + 4x_3 + 2x_4 = 8$

6. Find all solutions of the following system of linear equations by using Gauss-Jordan elimination.

Richard M. Timoney