

Math1204 Test 1

January 16th, 2017

Answer all questions and give complete reasons and checks for your answers. Please do not erase anything, just put a line through your work and continue; you cannot lose marks for anything you write. The parts of the questions are weighted as shown and can be answered in any order.

1. (a) Use row operations to find all solutions of these three equations and check your final solutions by substituting them back into the original equation. [9]

$$3w + 3x + 4y - 2z = -8$$

$$2w + 2x + 3y - 3z = -5$$

$$2w - 4x + 2y + 2z = 6$$

- (b) Explain how to use your answer to (a) to find a particular solution in which all of the variables have small integers in. [2]

2. (a) Use row operations on the this matrix representation of a system of equations and deduce that there is no solution to them. [7]

$$\left(\begin{array}{ccc|c} 3 & 1 & 1 & -1 \\ 1 & -2 & 0 & -1 \\ 0 & 1 & 1 & 3 \\ 1 & 3 & 1 & 1 \end{array} \right)$$

- (b) Remove any row from the matrix in (a) and re-use/continue your row operations to find the unique solution to the remaining three equations. What would the removed row have to equal for there to be a solution to the augmented matrix equation? [2]