

Math 1553 Worksheet 2

September 2, 2016

1. Find the parametric form for the general solution to the following system of equations, if such a solution exists:

$$\begin{cases} x_1 + x_2 + x_3 - x_4 = -3 \\ 2x_1 + 3x_2 + x_3 - 5x_4 = -9 \\ x_1 + 3x_2 - x_3 - 6x_4 = 7 \end{cases} \rightsquigarrow (x_1, x_2, x_3, x_4) = (?, ?, ?, ?).$$

2. Write $\begin{pmatrix} 6 \\ 11 \\ 6 \end{pmatrix}$ as a linear combination of the vectors

$$u = \begin{pmatrix} 2 \\ 1 \\ 4 \end{pmatrix} \quad v = \begin{pmatrix} 1 \\ -1 \\ 3 \end{pmatrix} \quad w = \begin{pmatrix} 3 \\ 2 \\ 5 \end{pmatrix}.$$

3. Decide if each of the following statements is true or false. If it is true, prove it; if it is false, provide a counterexample.

a) Every set of four or more vectors in \mathbf{R}^3 will span \mathbf{R}^3 .

b) The span of any set (including the empty set!) contains the zero vector.