MA 405-002: Introduction to Linear Algebra and Matrices, NCSU, Spring 2018

Written Homework #2
Due: Friday, February 16
Use of computer programs to solve systems of equations is acceptable.

1. (a) Find a set of vectors that span the subspace of $V = \mathbb{R}^4$ defined by the set of solutions to
   the system

$$x_1 + 2x_2 - x_3 + x_4 = 0$$
$$-3x_1 \qquad + x_3 + 2x_4 = 0$$

   (b) Is the set of vectors you found a basis for the set of solutions? Why?

   (c) What's the dimension of the set of solutions?

   (d) How many free variables are there?

2. Find a basis for the subspace, W, of P_4 defined by $W = \{p \mid p(1) = p'(0) = p''(0) = 0\}$.

3. Solve the systems.

   (a)

$$x \qquad + z + w = 4$$
$$2x + y \qquad - w = 2$$
$$3x + y + z \qquad = 14$$

   (b)

$$2x + y - z = 2$$
$$2x \qquad + z = 3$$
$$x - y \qquad = 0$$

   (c)

$$x \qquad + z + w = 4$$
$$2x + y \qquad - w = 2$$
$$3x + y + z \qquad = 6$$