Math 196-47, Mr. Church, Homework 6
Due at the beginning of class on Friday, May 1.
Please staple your homework.

1. Exercise 5.1.4. [For part (b), the set contains all vectors of the form (n, n, n) where n is a *natural* number; for example, the set contains $(7, 7, 7)$, but does not contain (π, π, π).]

2. Exercise 5.2.2.

3. Which of the following sets of vectors are linearly independent? If linearly independent, explain why briefly; if not, give a counterexample.

   (a)
$$\left\{ \begin{bmatrix} -2 \\ 1 \\ -3 \end{bmatrix}, \begin{bmatrix} 4 \\ -2 \\ 6 \end{bmatrix} \right\}$$

   (b)
$$\left\{ \begin{bmatrix} 2 \\ 1 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 \\ 1 \end{bmatrix} \right\}$$

   (c)
$$\left\{ \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} \right\}$$

   (d)
$$\left\{ \begin{bmatrix} 3 \\ -7 \\ 13 \end{bmatrix}, \begin{bmatrix} 27e^{\pi} \\ 123.45 \\ 98.7 \end{bmatrix}, \begin{bmatrix} 65365 \\ -1 \\ 42 \end{bmatrix}, \begin{bmatrix} 1000 \\ \sqrt{2} \\ 19.99 \end{bmatrix} \right\}$$

   (e)
$$\left\{ \begin{bmatrix} 1 \\ 0 \\ 4 \end{bmatrix}, \begin{bmatrix} 3 \\ 2 \\ 0 \end{bmatrix}, \begin{bmatrix} 2 \\ 6 \\ 1 \end{bmatrix} \right\}$$