Your name:

Math 22 Summer 2017, mini-quiz 2, Mon July 31

Please show your work. No credit is given for solutions without work or justification.

(1) Compute the determinant of $A = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 2 & 0 & 5 & 6 \\ 3 & 0 & 1 & 1 \\ 4 & 2 & 1 & 1 \end{bmatrix}$.

(2) Use the result from question 1 to find a basis for Row A, where A is the matrix from question 1, *without* row reducing:

(3) Let $H = \left\{ \begin{bmatrix} a \\ b \\ c \end{bmatrix} : 2a + b - c = 0 \right\}$.

(a) Prove H is a vector space. [Hint: there is no time nor space to test the basic axioms]

(b) Find a basis for H and state dim H.

(c) Every point in H is in the span of the set $\mathbf{e}_1$, $\mathbf{e}_2$, $\mathbf{e}_3$ (the unit vectors in $\mathbb{R}^3$). Is this set a basis for H, and why?