

Your name:

**Math 22 Fall 2016, mini-quiz 1, Mon Oct 3**

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

(1) Define what it means for a set of vectors  $\{\mathbf{v}_1, \dots, \mathbf{v}_n\}$  to be linearly independent:

(2) Is the matrix  $A = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 2 & 0 \\ 2 & 4 & 1 \end{bmatrix}$  invertible? Explain what result you used to deduce this.

(3) Let  $T : \mathbb{R}^3 \rightarrow \mathbb{R}^4$  be a linear transformation.

(a) Could  $T$  be onto? Prove your answer

(b) Could  $T$  be one-to-one? Prove your answer