Name: Thursday section time:
Student ID:

Math 20F - Linear Algebra - Spring 2003

Quiz #2 — April 17 — ANSWERS

1. Find the inverse of the matrix $\begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & 2 \\ 0 & 0 & 1 \end{pmatrix}$.

ANSWER: $\begin{pmatrix} 2 & -1 & 0 \\ -1 & 1 & -1 \\ 0 & 0 & 1 \end{pmatrix}$.
You should have used row operations to compute the inverse.

2. Let $\mathbf{b} = (1,\, 2,\, 3)^T$, $\mathbf{u} = (1,\, 1,\, 0)^T$, $\mathbf{v} = (1,\, 2,\, 0)^T$, and $\mathbf{w} = (1,\, 2,\, 1)^T$. Express $\mathbf{b}$ as a linear combination of $\mathbf{u}$, $\mathbf{v}$, and $\mathbf{w}$. Hint: work with the matrix $A = \begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & 2 \\ 0 & 0 & 1 \end{pmatrix}$.

ANSWER: $\mathbf{b} \;=\; 0\mathbf{u} + (-2)\mathbf{v} + 3\mathbf{w} \;=\; -\,2\mathbf{v} + 3\mathbf{w}$.

Method: Solve the system $A\mathbf{x} = \mathbf{b}$. *You may optionally use* A^{-1} *for this.*