

Math NYC: Quiz 2 (June 27, 2006) Name: _____

[marks]

Answer the questions on looseleaf. Show all your work! Scientific (non-graphing) calculators are permitted. Use proper mathematical notation and clearly indicate your final answer. Hand in the question sheet along with your answers.

- [6] 1. Use LU decomposition to solve:

$$\begin{bmatrix} 2 & 6 & -2 \\ 3 & 8 & -5 \\ -2 & -5 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 8 \\ 4 \\ -6 \end{bmatrix}$$

- [3] 2. Use Cramer's rule to solve for x_1 only:

$$\begin{aligned} 3x_1 + 2x_2 &= 11 \\ -x_1 + 4x_2 &= -13 \end{aligned}$$

3. Let $\vec{u} = (1, -3, 2)$ and $\vec{v} = (2, 0, 1)$. Find:

[1] (a) $\|\vec{u}\|$

[1] (b) $\vec{u} \cdot \vec{v}$

[1] (c) A unit vector with the same direction as \vec{u} .

[2] (d) The angle determined by \vec{u} and \vec{v} .