

PRINT Your Name: _____

Quiz for October 4, 2005

Find a basis for the null space of

$$A = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 1 & 0 \end{bmatrix}.$$

ANSWER: Replace $R_2 \mapsto R_2 - R_1$ to obtain:

$$\begin{bmatrix} 1 & 1 & 0 \\ 0 & 0 & 0 \end{bmatrix}.$$

So the null space of A is the set of all vectors of the form

$$x_2 \begin{bmatrix} -1 \\ 1 \\ 0 \end{bmatrix} + x_3 \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix},$$

where x_2 and x_3 are arbitrary. It is clear that

$$\boxed{\begin{bmatrix} -1 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}}$$

is a basis for the null space of A since these two vectors span the null space of A and are linearly independent.