Exam 3 Sp 2002 594

PRINT Your Name:_____

There are 10 problems on 4 pages. Each problem is worth 5 points. SHOW your work. $\boxed{CIRCLE}$ your answer. **CHECK** your answer whenever possible. **No Calculators.**

1. Define "basis". Use complete sentences.

The vectors $v_1, \ldots, v_n$ in the vector space V are a basis for V if $v_1 \ldots v_n$ are linearly independent and span V.

2. Define "null space". Use complete sentences.

The null space of the matrix A is the set of all vectors x with $Ax = 0$.

3. Let $W = \left\{ \begin{bmatrix} a_1 \\ a_2 \\ a_3 \end{bmatrix} \in \mathbb{R}^3 \middle| a_1 + a_2 = a_3^2 \right\}$. Is W a vector space? Explain.

No. $w = \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix} \in W$ but $2w = \begin{bmatrix} 2 \\ 0 \\ 2 \end{bmatrix} \notin W$ since $2+0 \neq (2)^2$

since $1+0=1^2$