

MATH 54 (Ribet), S205

Quiz 7, March 13, 2007

Name: \_\_\_\_\_

PROBLEM ONE [5 PTS.]

Find the determinant of this matrix. **Points of advice:** Exploit easy cofactor expansions, but avoid difficult cofactor expansions. Your answer should not depend on the values of  $x$ ,  $y$ , or  $z$ .

$$\begin{bmatrix} 1 & 2 & 4 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 3 & 9 & 0 & 0 & 0 & 0 \\ 1 & 4 & 1 & 1 & 7 & 5 & 3 \\ 0 & 0 & 0 & 0 & x & y & 1 \\ 0 & 0 & 0 & 0 & z & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 \end{bmatrix}$$

PROBLEM TWO [4 PTS.]

Consider the matrix below. Find and factor the characteristic polynomial. Find bases for its eigenspaces.

$$\begin{bmatrix} 0 & 0 & 3 \\ 0 & 0 & 3 \\ 1 & 2 & 0 \end{bmatrix}$$