

**Exam 3**

Linear Algebra, Dave Bayer, November 19, 2013

[1] Find the determinant of the matrix

$$\begin{bmatrix} 2 & 3 & 1 & 1 \\ 1 & 4 & 1 & 1 \\ 2 & 3 & 3 & 2 \\ 1 & 4 & 2 & 3 \end{bmatrix}$$

[2] Find the determinant of the matrix

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

[3] Find  $x/y$  where

$$\begin{bmatrix} a & b & c & d \\ 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} w \\ x \\ y \\ z \end{bmatrix} = \begin{bmatrix} a \\ b \\ c \\ d \end{bmatrix}$$

[4] Find the inverse of the matrix

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

[5] Find  $A^n$  where  $A$  is the matrix

$$\begin{bmatrix} 2 & -1 \\ -4 & -1 \end{bmatrix}$$