

Math 54 Worksheet 5
GSI: Lionel Levine
2/2/04

1. Let $A = \begin{pmatrix} 3 & -4 \\ 0 & 2 \end{pmatrix}$.

- (a) Find A^{-1} .
- (b) Express A^{-1} as a product of elementary matrices.
- (c) Express A as a product of elementary matrices.

2. Let $A = \begin{pmatrix} 1 & 3 & 4 \\ 2 & 2 & 4 \\ 3 & 1 & 4 \end{pmatrix}$.

- (a) Is A invertible?
- (b) Can you find a 3×1 matrix $X = \begin{pmatrix} x \\ y \\ z \end{pmatrix}$ such that $AX = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$?
- (c) Can you find numbers a, b and c such that

$$a \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} + b \begin{pmatrix} 3 \\ 2 \\ 1 \end{pmatrix} + c \begin{pmatrix} 4 \\ 4 \\ 4 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}?$$

- (d) Can you find numbers d, e and f such that

$$d \begin{pmatrix} 1 & 3 & 4 \end{pmatrix} + e \begin{pmatrix} 2 & 2 & 4 \end{pmatrix} + f \begin{pmatrix} 3 & 1 & 4 \end{pmatrix} = \begin{pmatrix} 0 & 0 & 0 \end{pmatrix}?$$