

M.

HW 5, sol'n

Sec. 2.3

34.

(a)

$\det A = abc$, hence A is invertible

$$\Leftrightarrow \det A \neq 0$$

$$\Leftrightarrow a, b, c \neq 0$$

the inverse is

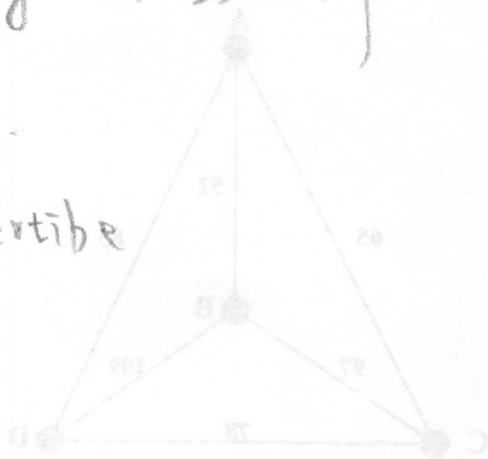
$$A^{-1} = \begin{pmatrix} \text{diag } 1/a, 1/b, 1/c \end{pmatrix}$$

(b) the same argument as above.

for $A = \text{diag } (a_{11}, \dots, a_{nn})$ invertible

iff $a_{ii} \neq 0$ for $\forall i$.

Sec. 2.4



Sec. 24

$$5. \begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{bmatrix} a & b \\ c & d \\ 0 & 0 \end{bmatrix}$$

$$8. \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix} = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$$

$$40. A = AB \cdot B^{-1} \quad AB = \begin{bmatrix} 1 & 3 \\ 2 & 5 \end{bmatrix}^{-1} = \begin{bmatrix} -5 & 3 \\ 2 & -1 \end{bmatrix}$$
$$= \begin{bmatrix} -5 & 3 \\ 2 & -1 \end{bmatrix} \begin{bmatrix} 1 & 2 \\ 3 & 5 \end{bmatrix} = \begin{bmatrix} 4 & 5 \\ -1 & -1 \end{bmatrix}$$

see back

Sec. 3.1

$$14. \begin{bmatrix} 1 & 1 \\ 1 & 2 \\ 1 & 3 \\ 1 & 4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \end{bmatrix} x_1 + \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} x_2.$$

hence, $\text{span} A = \left\{ (1 \ 1 \ 1 \ 1)^T, (1 \ 2 \ 3 \ 4)^T \right\}$.