

HW07

MATH 102, WINTER 2018

DUE WEDNESDAY, FEB 28

NAME:

Problem 1 Compute the determinants of A_2, A_3, A_4 . Can you predict A_n ?

$$A_2 = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix} \quad A_3 = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix} \quad A_4 = \begin{bmatrix} 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{bmatrix}$$

Problem 2 Compute the determinants of A, B, C . Are their columns independent?

$$A = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \quad C = \begin{bmatrix} A & 0 \\ 0 & B \end{bmatrix}.$$

Problem 3 Find A^{-1} from the cofactor formula $C^T / \det A$. Use symmetry in part (b)

$$(a) A = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 3 & 0 \\ 0 & 4 & 1 \end{bmatrix}. \quad (b) A = \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}.$$

Problem 4 A box has edges from $(0, 0, 0)$ to $(3, 1, 1)$, $(1, 3, 1)$, and $(1, 1, 3)$. Find its volume and also find the area of each parallelogram face.