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Worksheet 06/01

MAD 2104

Summer A 2015

1. Given the matrix

$$A = \begin{pmatrix} 1 & 1 & 1 \\ 0 & 1 & 0 \\ 0 & 0 & 2 \end{pmatrix} \text{ compute each of the following:}$$

(a)  $A^2 = A \cdot A =$

(b)  $A^3 = A^2 \cdot A =$

(c)  $A^4 = A^3 \cdot A =$

(d) Guess what  $A^n =$

**Note for Pb. 2:** The transpose  $A^T$  of a matrix  $A$  is the matrix such that the rows of  $A^T$  are the columns of  $A$ . If  $A$  is a 5 by 2 matrix (that is, a matrix with 5 rows and 2 columns), then obviously  $A^T$  is a 2 by 5 matrix.

2. Given the 3 by 2 matrices

$$A = \begin{pmatrix} 1 & 1 \\ 1 & -1 \\ 0 & 0 \end{pmatrix}, \quad B = \begin{pmatrix} 1 & 1 \\ 1 & 1 \\ 0 & 1 \end{pmatrix},$$

(a) Compute each of the following:

$A^T$

$B^T$

$A^T B$

$B^T A$

(b) Without actually computing, decide in each case if the following computation is possible. If yes, mention the type of the resulting matrix (e.g. 3 by 2, or 2 by 2, etc.)

$A + 3B$

$A^T + B$

$AB$

$B^2$

$BB^T$