COMPLEX NUMBERS & MATRICES (Q 3, PAPER 1)

LESSON NO. 4: MATRIX ALGEBRA

2005

3 (a) Given that $A = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$, show that $A^3 = A^{-1}$.

2003

3 (a) Evaluate $(1 \quad -2)\begin{pmatrix} 3 & 0 \\ -5 & 1 \end{pmatrix}\begin{pmatrix} 1 \\ -2 \end{pmatrix}$.

2002

3 (c) The following three statements are true whenever x and y are real numbers:

- $x + y = y + x$
- $xy = yx$
- If $xy = 0$ then either $x = 0$ or $y = 0$.

Investigate whether the statements are also true when x is the matrix $\begin{pmatrix} 3 & -1 \\ -6 & 2 \end{pmatrix}$ and y is the matrix $\begin{pmatrix} 2 & 3 \\ 6 & 9 \end{pmatrix}$.

2001

3 (c) (i) Write $(x \quad y)\begin{pmatrix} -2 & 3 \\ -4 & 5 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix}$ in the form $ax^2 + bxy + cy^2$ where $a, b, c \in \mathbf{Z}$.

ANSWERS

2003 3 (a) (17)

2001 3 (c) (i) $-2x^2 - xy + 5y^2$