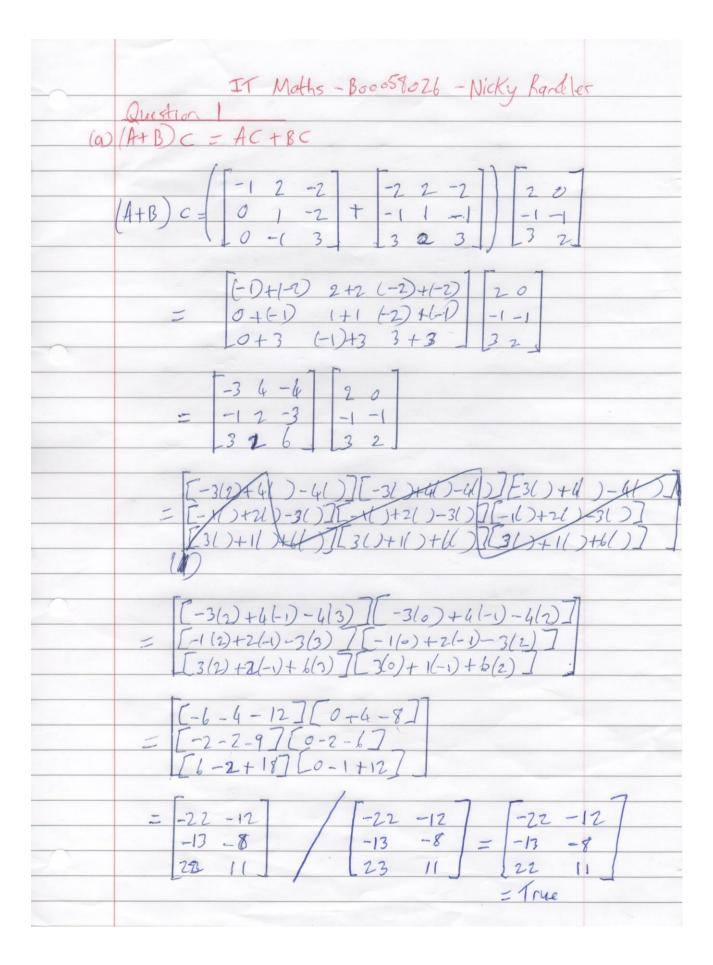
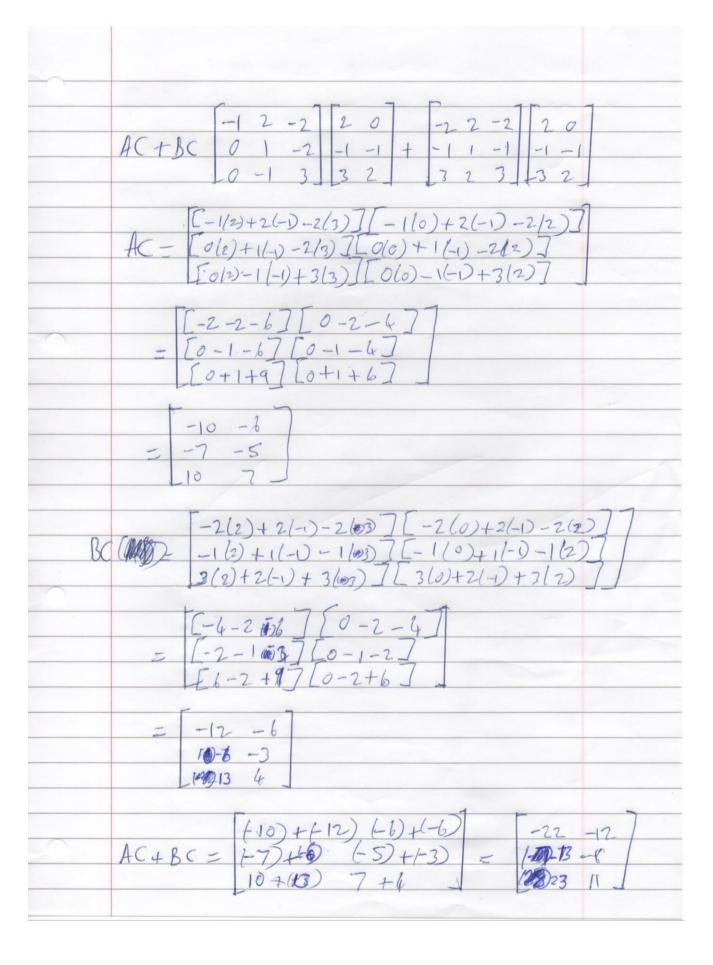
Nicky Randles – B00058026

IT Mathematics

Assignment 2







(b)
$$A^{r} + B^{r} = (A+B)^{r}$$
 $A^{r} + B^{r} = \begin{bmatrix} -1 & 0 & 0 & 1 & 2 & -1 & 3 \\ 2 & 1 & -1 & 1 & 2 & 1 & 2 \\ -2 & -2 & 3 & 2 & 2 & -1 & 3 \end{bmatrix}$

$$= \begin{bmatrix} -1 + (-2) & 0 + (-1) & 0 + 3 \\ 2 + 2 & 1 + 1 & (-1) + 2 \\ 1 - 2 + 2 & (-2) + (-2) & 3 + 3 \end{bmatrix}$$

$$= \begin{bmatrix} -3 & -(-1) & 2 & -2 & 1 & -2 & 2 & 2 \\ 0 & 1 & -2 & 4 & -1 & 1 & -1 \\ 0 & -1 & 3 & 4 & 3 & 2 & 3 \end{bmatrix}$$

$$= \begin{bmatrix} -1 & 2 & -2 & 1 & -2 & 2 & -2 \\ 0 & 1 & -2 & 4 & -1 & 1 & -1 \\ 0 & -3 & 6 & 3 & 2 & 3 \end{bmatrix}$$

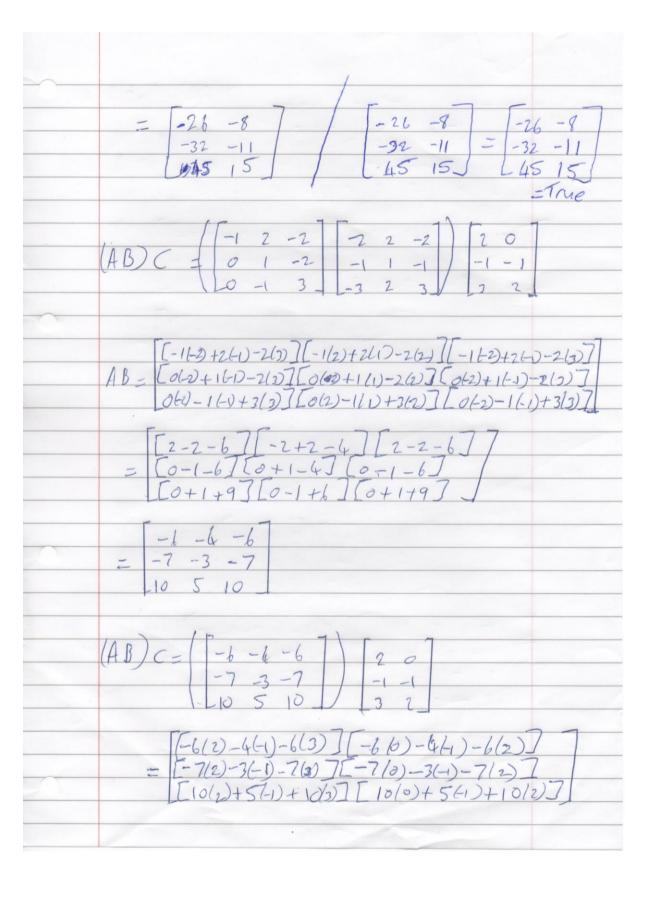
$$= \begin{bmatrix} -1 & 2 & -2 & 1 & -2 & 2 & -2 \\ 0 & 1 & -2 & 4 & -1 & 1 & -1 \\ 0 & -1 & 3 & 2 & 3 & 2 & 3 \end{bmatrix}$$

$$= \begin{bmatrix} -1 & 4 & -2 & 1 & -2 & 2 & -2 \\ 0 & 1 & -2 & 4 & -1 & 1 & -1 \\ 0 & +3 & (-1) & +1 & (-2) & +(-2) & -1 \\ 0 & +3 & (-1) & +2 & 3 & +3 \end{bmatrix}$$

$$= \begin{bmatrix} -3 & -(-1) & 2 & 2 & 1 & -2 \\ -3 & 1 & 6 & 3 & -2 & -2 \\ -3 & 1 & 6 & 3 & -2 & -2 \\ -4 & 2 & 1 & -6 & -3 & 6 \end{bmatrix}$$

$\begin{bmatrix} -3 & -1 & 3! & -3 & -1 & 3 \\ 4 & 2 & 1 & = & 4 & 2 & 1 & = True \\ -4 & -3 & 6 & & -4 & -3 & 6 \end{bmatrix}$	
$(C) B^{T} A^{T} = (A+B)^{T}$	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	
	(-1)+3(3)])+2(3)] -2(3)]
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	
6-7 10 = 4-3 5 6-7 10	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	
$\frac{\left[-\frac{1}{4}+2(-1)-2(3)7[-\frac{1}{2}+2(1)-2(2)][-\frac{1}{4}]}{\left[-\frac{1}{2}+2(1)-2(3)7[-\frac{1}{2}+2(1)-2(2)][-\frac{1}{2}+2(1)-2(2)[-\frac{1}{2}+2(2)][-\frac{1}{2}+2(2)[-\frac{1}{2}+2(2)][-\frac{1}{2}+2(2)[-\frac{1}{2}+2(2)][-\frac{1}{2}+2(2)[-\frac{1}{2}+2(2)][-\frac{1}{2}+2(2)[-\frac{1}{2}+2(2)[-\frac{1}{2}+2(2)[-\frac{1}{2}+2(2)][-\frac{2}+2(2)[-\frac{1}{2}+2(2)[-\frac{1}{2}+2(2)[-\frac{1}{2}+2(2)[-\frac{1}{2}+2(2)[-$	1 42(-2-26)] (-1)-2(3)] 1)+3/3)

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\frac{-6-7}{5}$ $\frac{-6-7}{6}$ $\frac{-7}{6}$ $\frac{-7}$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$



$\begin{bmatrix} E - 12 + 4 & -18 \end{bmatrix} \begin{bmatrix} 0 + 4 - 12 \end{bmatrix}$ $= \begin{bmatrix} -14 + 3 - 21 \end{bmatrix} \begin{bmatrix} 0 + 3 - 14 \end{bmatrix}$ $= \begin{bmatrix} 20 - 5 + 30 \end{bmatrix} \begin{bmatrix} 0 - 5 + 20 \end{bmatrix}$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
 Quection 3
$1.5 \times + 3.1 y = 10.8$ $2.5 \times + 4.1 y = 14.8$
$ \begin{bmatrix} 1.5 & 3.1 \\ 2.5 & 4.1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 10.8 \\ 14.8 \end{bmatrix} $
$\begin{bmatrix} x \\ x \end{bmatrix} = A - 1 \begin{bmatrix} 10.8 \\ 14.8 \end{bmatrix}$
$det(A) = 1.5 \times 4.1 - 2.5 \times 3.1 = 6.15 - 7.75 = -1.6$
$A^{-1} = 1$ $det(A)$ $\begin{bmatrix} 4 \cdot 1 & 25 \end{bmatrix} = 1$ $\begin{bmatrix} 4 \cdot 1 & -2 \cdot 5 \end{bmatrix}$ $1 \cdot 6$ $\begin{bmatrix} -3 \cdot 1 & 1 \cdot 5 \end{bmatrix}$
$\begin{bmatrix} X \\ Y \end{bmatrix} = A^{-1} \begin{bmatrix} 10.8 \\ 14.8 \end{bmatrix} = 1 \begin{bmatrix} 4.1 & -2.5 \\ 16 & -3.1 \end{bmatrix} \begin{bmatrix} 10.8 \\ 14.4 \end{bmatrix}$

Question 4
$AB = \begin{array}{c ccccccccccccccccccccccccccccccccccc$
[4.0(7)+3.3(-6)+2.9(-1)][4.0(-1)+3.3(-1)+2.9(-1)][4.0(-1)+3.3(-1)+3.4(-1)][4.0(-1)+3.4(-1)+3.4(-1)][4.0(-1)+3.4(-1)+3.4(-1)][4.0(-1)+3.4(-1
$ \begin{bmatrix} 28 - 13 \cdot 2 - 5 \cdot 8 \end{bmatrix} \begin{bmatrix} -12 + 23 \cdot 76 - 11 \cdot 6 \end{bmatrix} \begin{bmatrix} -11 \cdot 2 - 9 \cdot 24 + 20 \cdot 59 \end{bmatrix} = \begin{bmatrix} 23 \cdot 1 - 18 - 6 \cdot 8 \end{bmatrix} \begin{bmatrix} -9 \cdot 9 + 32 \cdot 4 - (3 \cdot 6) \end{bmatrix} \begin{bmatrix} -924 - 12 \cdot 6 + 24 \cdot 16 \end{bmatrix} \begin{bmatrix} 20 \cdot 3(6) - 12 \cdot 4 - 7 \cdot 8 \end{bmatrix} \begin{bmatrix} -8 \cdot 7 + 22 \cdot 32 - 15 \cdot 6 \end{bmatrix} \begin{bmatrix} -8 \cdot 12(6) & 8 \cdot 68 + 27 \cdot 69 \end{bmatrix} $
9 0.2 0.2 = -1.7 8.6 2.3 0.1 -2 10.9
Calculating the determinant by using diagonal method:
9 0.2 0.2 9 0.2 0.2 -1.7 8.6 2.8; -1.7 1.6 2.3 0.1 -2 10.9 0.1 -2 10.9
Downward diagonals: 9 × 8.6 × 10.9+0.2 × (2000) 2.3 × 0.1+ 0.2 × (-1.7) × (-2) = 843.66 +0.046 + 0.68 = 844.346
Upward diagonals: $0.1 \times 8.6 \times 0.2 \pm (-2) \times 2.3 \times 9 + 10.9$ $\times (-1.7) \times 0.2 = 0.172 + (-41.4) + -3.706 = -44.934$
det (A) = 864.386 - (-46.936) = 889.32 A-1 doss not exist.