

## Functional Mathematics

### Task 6 - Matrices

Due date:

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

Find:

i)  $(2A+B)$

[1.5 marks]

ii)  $(A-2B)$

[1.5 marks]

2. Given  $C = \begin{bmatrix} 6 & -2 & -9 \\ 0 & 4 & 6 \\ -3 & -5 & 1 \end{bmatrix}$  and  $D = \begin{bmatrix} -4 & 5 \\ 1 & -8 \\ -2 & 7 \end{bmatrix}$ .

Find:

i)  $CD$

[1.5 marks]

ii)  $DC$

[1.5 marks]

3. The letters A to Z correspond to the numbers 1 to 26, as shown below, and a space is represented by the number 27.

| A  | B  | C  | D  | E  | F  | G  | H  | I  | J  | K  | L  | M  |
|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| N  | O  | P  | Q  | R  | S  | T  | U  | V  | W  | X  | Y  | Z  |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |

Use matrix  $A = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$  to decode the message below:

$$\begin{bmatrix} 64 \\ 23 \end{bmatrix} \begin{bmatrix} 102 \\ 41 \end{bmatrix} \begin{bmatrix} 82 \\ 32 \end{bmatrix}$$

[4 marks]

### Bonus Task

4. Using matrices, solve the following set of equations:

$$x + 3y + 2z = 17$$

$$2x + y - 3z = -4$$

$$-3x - 2y + z = 5$$

[5 marks]