

## MATHEMATICS HOMEWORK

### L3 ALL

1.

If  $B = \begin{bmatrix} 1 & 0 \\ 4 & 7 \end{bmatrix}$ , find  $2B$  and  $-3B$ .

If  $A = \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$  and  $B = \begin{bmatrix} 5 & 1 \\ 0 & 3 \end{bmatrix}$ , find  $AB$  and  $BA$ . Is  $AB=BA$ ?

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2. Find  $AB$  and  $\text{tr}(B)$

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

3.

$$A = \begin{bmatrix} 2 & 5 & 7 \\ 2 & -1 & 0 \\ 3 & 4 & 8 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 4 & 9 \\ 3 & -2 & 4 \\ -5 & 6 & 8 \end{bmatrix} \quad \text{verify that (i) } (A+B)^T = A^T + B^T \text{ and (ii) } (AB)^T = B^T A^T.$$

(iii) Find  $\det(A)$  and  $|B|$

4.

$$\text{If } A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}, B = \begin{bmatrix} 1 & x \\ 4 & y \end{bmatrix} \text{ and } (A+B)^2 = A^2 + B^2, \text{ find } x \text{ and } y.$$