**CHAPTER 3**

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| **Objective :** | Check some linear algebra rules:  • Is matrix addition commutative? Compute A+B and then B+A . Are the results the same? • Is matrix addition associative? Compute (A + B) + C and then A + (B + C)in the order prescribed. Are the results the same?  • Is multiplication with a scalar distributive? Compute α(A + B) and αA +αB, taking α = 5 and show that the results are the same.  • Is multiplication with a matrix distributive? Compute A\*(B+C) and compare with A\*B + A\*C.  • Matrices are diﬀerent from scalars! For scalars, ab = ac implies that b = c if a = 0. Is that true for matrices? Check by computing A\*B and A\*C for the matrices given above. In general, matrix products do not commute either (unlike scalar products). Check if A\*B and B\*A give diﬀerent results. |
| **MATLAB**  **Code:** | A = [2 6 ;3 9]  B = [1 2;3 4]  C = [-5 5;5 3]  %commutative  A+B  B+A  %associative  (A+B)+ C  A + (B+C)  %distributive  5\*(A+B)  5\*A + 5\*B  A\*(B+C)  A\*B +A\*C |

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| **Output:** | A = 2 6  3 9  B = 1 2  3 4  C = -5 5  5 3  ans =  3 8  6 13  ans =  3 8  6 13  ans =  -2 13  11 16  ans =  -2 13  11 16  ans =  15 40  30 65  ans =  15 40  30 65  ans =  40 56  60 84  ans =  40 56  60 84 |