THEOREM 1.4.1 Properties of Matrix Arithmetic

Assuming that the sizes of the matrices are such that the indicated operations can be performed, the following rules of matrix arithmetic are valid.

(a) $A + B = B + A$ [Commutative law for matrix addition]

(b) $A + (B + C) = (A + B) + C$ [Associative law for matrix addition]

(c) $A(BC) = (AB)C$ [Associative law for matrix multiplication]

(d) $A(B + C) = AB + AC$ [Left distributive law]

(e) $(B + C)A = BA + CA$ [Right distributive law]

(f) $A(B - C) = AB - AC$

(g) $(B - C)A = BA - CA$

(h) $a(B + C) = aB + aC$

(i) $a(B - C) = aB - aC$

(j) $(a + b)C = aC + bC$

(k) $(a - b)C = aC - bC$

(l) $a(bC) = (ab)C$

(m) $a(BC) = (aB)C = B(aC)$