Rules for vectors

$$\mathbf{x} + \mathbf{y} = \mathbf{y} + \mathbf{x}$$

$$\mathbf{x} = (\mathbf{y} + \mathbf{z}) = (\mathbf{x} + \mathbf{y}) + \mathbf{z}$$

$$\mathbf{O} + \mathbf{x} = \mathbf{x} + \mathbf{O} = \mathbf{x}$$

$$\mathbf{X} + -\mathbf{x} = -\mathbf{x} + \mathbf{x} = \mathbf{O}$$

$$(\lambda\mu)\,\mathbf{x} = \lambda(\mu\mathbf{x})$$

$$\lambda\,(\mathbf{x} + \mathbf{y}) = \lambda\mathbf{x} + \lambda\mathbf{y}$$

$$(\lambda + \mu)\mathbf{x} = \lambda\mathbf{x} + \mu\mathbf{x}$$

$$0\mathbf{x} = 0 \qquad 1\mathbf{x} = \mathbf{x} \qquad (-1)\mathbf{x} = -\mathbf{x}$$

Rules for matrices

$$A + B = B + A$$

$$A + (B + C) = (A + B) + C$$

$$A + O = O + A = A$$

$$A + -A = -A + A = O$$

$$\lambda(\mu A) = (\lambda \mu)A$$

$$\lambda(A + B) = \lambda A + \lambda B$$

$$1A = A \quad (-1)A = -A$$

Matrix multiplication is NOT commutative.

$$A.(B.C) = (A.B).C$$

$$A.I = I.A = A$$

$A^{-1}.A = A.A^{-1} = I$ provided $\det A \neq 0$

$$A.(B + C) = A.B + A.C$$

$$(B + C).A = B.A + C.A$$

$$(\lambda A).B = A.(\lambda B) = \lambda(A.B)$$