Some Algebraic Properties of R^n

For all $\mathbf{u}$, $\mathbf{v}$, $\mathbf{w} \in R^n$ and all scalars c and d:

    (i) $\mathbf{u} + \mathbf{v} = \mathbf{v} + \mathbf{u}$

    (ii) $(\mathbf{u} + \mathbf{v}) + \mathbf{w} = \mathbf{u} + (\mathbf{v} + \mathbf{w})$

    (iii) $\mathbf{u} + \mathbf{0} = \mathbf{0} + \mathbf{u} = \mathbf{u}$

    (iv) $\mathbf{u} + (\mathbf{-u}) = \mathbf{-u} + \mathbf{u} = \mathbf{0}$ where $\mathbf{-u}$ denotes $\mathbf{-1u}$

    (v) $c(\mathbf{u} + \mathbf{v}) = c\mathbf{u} + c\mathbf{v}$

    (vi) $(c + d)\mathbf{u} = c\mathbf{u} + d\mathbf{u}$

    (vii) $c(d\mathbf{u}) = (cd)\mathbf{u}$

    (viii) $1\mathbf{u} = \mathbf{u}$