$$\mathbb{T} \times \mathbb{H} = \mathbb{T} \times \mathbb{H} + \mathbb{T} \mathbb{T} \times \mathbb{H}$$

$$RHS \ = \overline{\mathbb{III} - \mathbb{III}} \, \mathbb{II} + \, \mathbb{IIII} - \, \mathbb{III} = \, \mathbb{IIII} - \, \mathbb{IIII} = \, LHS$$

$$\mathbb{T} \times \mathbb{H} = \mathbb{I} \times \mathbb{H} - \mathbb{H} \mathbb{I} \times \mathbb{H}$$

$$RHS = 1 + 1 + 1 + 1 + 1 + 1 = 1 + 1 + 1 = LHS$$