Answer

There exists a function f satisfying the formula

$$f = [n \in Int \mapsto \text{IF } n = 0 \text{ THEN } 1 \text{ ELSE } n * f[n-1]]$$

For example, it is satisfied by the function

$$[n \in Int \mapsto \text{IF } n \in Nat \text{ THEN } FactorialOp(n) \text{ ELSE } 0]$$

Hence, $IntFact$ is a function that satisfies this formula, so $IntFact[-3]$ equals $(-3) * IntFact[-4]$. However, $-3 * IntFact[-4]$ equals $-(3 * IntFact[-4])$ (by the operator precedence rules of TLA$^+$). Since we don't know if $IntFact[-4]$ is a number, we don't know if $(-3) * IntFact[-4]$ equals $-(3 * IntFact[-4])$. So, we don't know if $IntFact[-3]$ equals $-3 * IntFact[-4]$.

CLOSE