EXERCISE ON TRUTH-TREES, DERIVATIONS, AND MATHEMATICAL INDUCTION

1. Determine by means of a truth-tree whether either of the following sentences is valid. If valid, derive it from the null set.

   (a) \((\exists x)Fx \iff P\) \(\rightarrow\) \((x)(Fx \iff P)\)

   (b) \((x)(Fx \iff P) \rightarrow ((\exists x)Fx \iff P)\)

2. What does the preceding problem presuppose about our rules of derivation?

3. Prove that the sum of the first \(n\) even numbers is equal to \(n(n + 1)\).