#### Example: Proof by induction

Proof:

• Let ⋅ 2 + 21) + 1 > 2(n + 1) + n ∈ ℕ44(. For all n + 1 > 2n + n = 2n ≥ 22 it applies that 2 4n + 1 > 2n + 4n +1 > 2n + 2 42n + 1 + 4 > 2n + 2 + . 4 ⋅ 2 + 1 = 9 > 6 = 4(4n +2

Base case: For the statement is obviously correct because

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Induction step: We assume that is correct and must show that

n + 1) + 1 = 4n + 4 + 1 = 4n + 1 + 4 > 2n + 2 + 4 > 2n + 2 + 2 is also correct. • . Thus, the assertion follows n2 □ . = 4 ≥ 4 = 2 ⋅ 2 ≥ 2(n=

then it is also true that

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1) 1 ≥ 2n 2 2 .

2n + 1 = 4n + □ , it follows that

it follows in general that fore valid.