(Definitions) Let

We will prove three lemmas first.

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|  |  |
| from definition of |  |
| distributive property |  |
| from the definition of |  |
| by induction |  |

The last step is a simple induction:

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|  |  |
| from the definition of |  |
|  |  |
|  | |
| from the definition of |  |
| distributive property |  |
| The first two terms is the LHS of the induction hypothesis and the last term is bounded by . |  |
|  | = |
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|  |  |
| --- | --- |
|  |  |
|  |  |
| from the definition of |  |
| Distributive property |  |
| since it’s a mistake |  |
| from definition of and |  |
|  |  |
| By induction |  |

The last step follows from another simple induction:

|  |  |
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|  |  |
|  |  |
| from the definition of |  |
|  |  |
|  | |
| from the definition of |  |
| distributive property |  |
| The first two terms is the LHS of the induction hypothesis and the last term is bounded by . |  |
|  | = |
|  |  |