Chapter 1 Homework

1. *Write a formula expressing z = <<x,y>, <v,w>> using just ϵ and =.*

SOLUTION.

$<x, y> = \{\{x\}, \{x, y\}\}$

$<v, w> = \{\{v\}, \{v, w\}\}$

$z = <<x, y>, <v, w>> = \{\{<x, y>\}, \{<x, y>, <v, w>\}\} = \{\{\{\{x\}, \{x, y\}\}\}, \{\{\{x\}, \{x, y\}\}, \{\{v\}, \{v, w\}\}\}\}$

2. *Show that $\alpha < \beta$ implies that $\gamma + \alpha < \gamma + \beta$ and $\alpha + \gamma \leqslant \beta + \gamma$. Give an example to show that the "$\leq$" cannot be replaced by "$<$". Also show: $\alpha \leq \beta \rightarrow \exists! \delta(\alpha + \delta = \beta)$.*

SOLUTION.