Consider A, B, C. Compare those sets:
1. $A \cap (B \cup C)$ and $(A \cap B) \cup (A \cap C)$
2. $A \cup (B \cap C)$ and $(A \cup B) \cap (A \cup C)$

1. Let $x \in A \cap (B \cup C)$
$\Rightarrow x \in A$ and ($x \in B$ or $x \in C$)
Applying the rule of replacement in classical logic
$\Rightarrow$ ($x \in A$ and $x \in B$) or ($x \in A$ and $x \in C$)
$\Rightarrow x \in (A \cap B) \cup (A \cap C)$

2. Let $x \in A \cup (B \cap C)$
$\Rightarrow$ ($x \in A$ or $x \in B$) and ($x \in A$ or $x \in C$)
$\Rightarrow x \in (A \cup B) \cap (A \cup C)$