# Ideal Quaternary Semantics of Attack Trees

Basic Properties for Choice:

$$A \leq_4 (A \sqcup_I B)$$

$$B \leq_4 (A \sqcup_I B)$$

$$(A \sqcup_I B) \equiv (B \sqcup_I A)$$

$$((A \sqcup_I B) \sqcup_I C) \equiv (A \sqcup_I (B \sqcup_I C))$$

If $A \leq_4 C$ and $B \leq_4 D$, then $(A \sqcup_I B) \leq_4 (C \sqcup_I D)$

# Ideal Quaternary Semantics of Attack Trees

Basic Properties for Parallel:

$$(A \odot_I A) \not\equiv A$$

$$(A \odot_I B) \equiv (B \odot_I A)$$

$$((A \odot_I B) \odot_I C) \equiv (A \odot_I (B \odot_I C))$$

If $A \leq_4 C$ and $B \leq_4 D$, then $(A \odot_I B) \leq_4 (C \odot_I D)$

$$(A \odot_I (B \sqcup_I C)) \equiv ((A \odot_I B) \sqcup_I (A \odot_I C))$$