

Werk

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If $F \cap I = \emptyset$, then T is a congruence and \bar{T} is an extension of T .

Suppose $F \cap I \neq \emptyset$, let $e \in F \cap I$, $x \leq e \leq y$. Denote $\bar{d} = \bar{d} \vee e$, $\bar{c} = \bar{c} \wedge e$. Clearly $\bar{c} \leq \bar{d}$, $\bar{c}, \bar{d} \in I \cap F$. Then $\bar{z} \wedge \bar{c} = \bar{z} \wedge \bar{c} \wedge e = x$, $y \geq \bar{z} \vee \bar{d} = \bar{z} \vee \bar{d} \vee e \geq (\bar{z} \wedge \bar{d}) \vee (\bar{z} \wedge \bar{d}) \vee e = y$, thus \bar{z} is a relative bicomplement of $\langle \bar{c}, \bar{d} \rangle$ in $\langle x, y \rangle$ in D . But $\langle \bar{c}, \bar{d} \rangle$ cannot have a relative bicomplement in $\langle x, y \rangle$ in L for if b were such a bicomplement, $x = x \vee x = x \vee (b \wedge \bar{c})$, $y = \bar{d} \vee b = \bar{d} \vee (b \wedge y)$, $[x \vee (b \wedge \bar{c}), \bar{d} \vee (b \wedge y)] \in T \Rightarrow [x, y] \in T$. Consequently, L is not closed under relative bicomplements. Q.E.D.

An immediate consequence of Propositions 2, 3, 4 is

Theorem. Let L be a sublattice of a distributive lattice D . $[D, L]$ has TEP if and only if L is closed in D under relative bicomplements.

References

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