# Complemented lattices edit

**Abbreviation: CdLat**

**Definition 1.** A *complemented lattice* is a bounded lattices $\mathbf{L} = \langle L, \vee, 0, \wedge, 1\rangle$ such that

every element has a complement: $\exists y(x \vee y = 1$ and $x \wedge y = 0)$

**Morphisms.** Let $\mathbf{L}$ and $\mathbf{M}$ be complemented lattices. A morphism from $\mathbf{L}$ to $\mathbf{M}$ is a function $h : L \to M$ that is a bounded lattice homomorphism:

$h(x \vee y) = h(x) \vee h(y)$, $h(x \wedge y) = h(x) \wedge h(y)$, $h(0) = 0$, $h(1) = 1$

**Basic Results.**

**Examples.**

**1.** $\langle P(S), \cup, \emptyset, \cap, S\rangle$, the collection of subsets of a set $S$, with union, empty set, intersection, and the whole set $S$.

**Properties.** (description)

| | |
|---|---|
| Classtype | first-order |
| Equational theory | decidable |
| Quasiequational theory | |
| First-order theory | undecidable |
| Locally finite | no |
| Residual size | unbounded |
| Congruence distributive | yes |
| Congruence modular | yes |
| Congruence n-permutable | yes |
| Congruence regular | no |
| Congruence uniform | no |
| Congruence extension property | no |
| Definable principal congruences | no |
| Equationally def. pr. cong. | no |
| Amalgamation property | |
| Strong amalgamation property | |
| Epimorphisms are surjective | |

**Finite Members.** $f(n) =$ number of members of size $n$.

$$
\begin{aligned}
f(1) &= 1 \\
f(2) &= 1 \\
f(3) &= 0 \\
f(4) &= 1 \\
f(5) &= 2 \\
f(6) &= \\
f(7) &= \\
f(8) &=
\end{aligned}
$$

**Subclasses.**
Complemented modular lattices

**Superclasses.**
Bounded lattices

## References

[1]