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Conjunctive Normal Form



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A statement is in conjunctive normal form if it is a conjunction (sequence of ANDs) consisting of one or more conjuncts, each of which is a disjunction (OR) of one or more literals (i.e., statement letters and negations of statement letters; Mendelson 1997, p. 30). Examples of conjunctive normal forms include

$$A$$
 (1)

$$(A \lor B) \land (! A \lor C) \tag{2}$$

$$A \vee B$$
 (3)

$$A \wedge (B \vee C),$$
 (4)

where ∨ denotes OR, ∧ denotes AND, and ! denotes NOT (Mendelson 1997, p. 30).

Every statement in logic consisting of a combination of multiple \land , \lor , and !s can be written in conjunctive normal form.

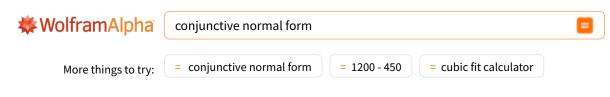
An expression can be put in conjunctive normal form using the Wolfram Language using the following code:

```
ConjunctiveNormalForm[f_] :=
 Not[LogicalExpand[Not[f]]] //. {
  Not[a_Or] :> And @@ (Not /@ List @@ a),
  Not[a_And] :> Or @@ (Not /@ List @@ a)
}
```

SEE ALSO

AND, Disjunctive Normal Form, Literal, Negation, Normal Form, OR, Statement Letter

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