Key Terms from *How Logic Works*

Glossary terms

consequent
The consequent of a conditional is the sentence that occurs after "then".

contingency
A sentence that is true in some situations and false in other situations.

counterexample
A situation (formalized) in which the premises are true and the conclusion is false.

dependency number
A number in the leftmost column of a proof indicating which assumptions are in force at that step.

disjunction
A sentence whose main connective is "or" ($\vee$).

existential quantifier
The symbol $\exists$ ("some" / "there is").

expressively complete
A collection of connectives that can express all truth functions.

inconsistency
A sentence that is false in all situations.

interpretation
An assignment of symbols to set-theoretic structures.

main column
The column in a truth table corresponding to the main connective of the sentence.

main connective
For a propositional sentence φ, the last connective in the construction of φ.

model
A model of a theory is an interpretation in which all the theory's sentences are true.

necessary condition
In "if φ, then ψ," the consequent ψ is a necessary condition for φ.

reconstrual
A reconstrual assigns nonlogical symbols to corresponding syntactic structures.

sequent
A list of premises, a turnstile, and a conclusion; a symbolic representation of a valid argument form.

signature
A set of nonlogical symbols: propositional constants, relation, function, and constant symbols.

sound
A sound proof system never proves things it shouldn't.

subformula
Any formula that occurs in the construction of φ.

substitution
Replacing nonlogical symbols with other suitable syntactic structures.

substitution instance
A sentence resulting from another by a uniform replacement of nonlogical terms.

sufficient condition
In "if φ, then ψ," the antecedent φ is a sufficient condition for ψ.

translation
A map from formulas to formulas, generated by a reconstrual of nonlogical vocabulary.

truth-functional
A connective is truth-functional iff its truth value is a function of the truth values of its component sentences.

universal quantifier
The symbol $\forall$ ("all" / "every").

valid
An argument is valid iff its premises provide decisive support for its conclusion (equivalently: if the truth of its premises guarantees the truth of its conclusion).

variable
A symbol such as x that plays the role of an open term.

Common acronyms (proof justifications)

CNF
conjunctive normal form

DM
DeMorgan's rule

DNF
disjunctive normal form

EFQ
ex falso quodlibet

EM
law of excluded middle

MP
modus ponens

MT
modus tollens

QN
quantifier negation equivalences

RAA
reductio ad absurdum