Logic: What is it?

– A Collection of Definitions of 'Logic' and 'Mathematical Logic

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Definitions of 'Reasoning' in Dictionaries

- "The process by which one judgment is deduced from another or others whic are given." [The Oxford English Dictionary, 2nd Edition]
- "The drawing of inferences or conclusions through the use of reason. [Longman Dictionary of the English Language]
- "The drawing of inferences or conclusions through the use of reason. [Webster's Third New International Dictionary of the English Language]
- "The process of forming conclusions, judgments, or inferences from facts c premises." [The Random House Dictionary of the English Language, 2n Edition]
- "Use of reason, especially to form conclusions, inferences, or judgments. [The American Heritage Dictionary of the English Language, 3rd Edition]

Definitions of 'Inference' in Dictionaries

- "The drawing of a conclusion from known or assumed facts or statements; th forming of a conclusion from data or premises, either by inductive or deductiv methods; reasoning from something known or assumed to something els which follows from it." [The Oxford English Dictionary, 2nd Edition]
- "The act or an instance of passing from one proposition accepted as true t another whose truth is believed to follow from that of the former." [Longma Dictionary of the English Language]
- "The act of passing from one or more propositions, statements, or judgment considered as true to another the truth of which is believed to follow from tha of the former." [Webster's Third New International Dictionary of the Englis Language]
- "The process of deriving the strict logical consequences of assumed premises. [The Random House Dictionary of the English Language, 2nd Edition]
- "The act or process of deriving logical conclusions from premises known c assumed to be true." [The American Heritage Dictionary of the Englis Language, 3rd Edition]

Definitions of 'Argument' in Dictionaries

- "A statement or fact advanced for the purpose of influencing the mind; reason urged in support of a proposition; spec. in Logic, the middle term in syllogism." [The Oxford English Dictionary, 2nd Edition]
- "A connected series of statements or reasons intended to establish a positio (and, hence, to refute the opposite); a process of reasoning; argumentation. [The Oxford English Dictionary, 2nd Edition]
- "Statement of the reasons for and against a proposition; discussion of question; debate." [The Oxford English Dictionary, 2nd Edition]
- "A reason given to support or disprove something; the use of reason to decid something." [Longman Dictionary of the English Language]
- "A reason or matter for dispute or contention." "A course of reasoning aime at demonstrating truth or falsehood." "A fact or statement put forth as proof c evidence." [The American Heritage Dictionary of the English Language, 3r Edition]

Logic: What Is It? – Definitions of 'Logic' in Dictionaries

- "The branch of philosophy that treats of the forms of thinking in general, an more especially of inference and of scientific method." [The Oxford Englis Dictionary, 2nd Edition]
- "The fundamental science of thought and its categories (including metaphysic or ontology)." [The Oxford English Dictionary, 2nd Edition]
- "The science or art of reasoning as applied to some particular department c knowledge or investigation." [The Oxford English Dictionary, 2nd Edition]
- "A branch of philosophy that deals with the formal principles and structure c sound thought and reasoning." [Longman Dictionary of the English Language]

Logic: What Is It? – Definitions of 'Logic' in Dictionaries

- "A science that deals with the canons and criteria of validity in thought an demonstration and that traditionally comprises the principles of definition an classification and correct use of the terms and the principles of correc predication and the principles of reasoning and demonstration." [Webster' Third New International Dictionary of the English Language]
- "The science on the normative formal principles of reasoning." [Webster' Third New International Dictionary of the English Language]
- "The science of correct reasoning." [Webster's Third New Internationa Dictionary of the English Language]
- "The science which investigates the principles governing correct or reliabl inference." [The Random House Dictionary of the English Language]
- "The study of the principles of reasoning, especially of the structure c propositions as distinguished from their content and of method and validity i deductive reasoning." [The American Heritage Dictionary of the Englis Language, 3rd Edition]

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is the science of sciences, and the art of arts."
  – John Duns Scotus, 13th century.
- "Logic is the art of using reason well in our inquiries after truth, and th communication of it to others."
  – I. Watts, "Logic," 1724, 1847, Soli Deo Gloria Publications, 1996.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Reasoning is for the most part carried on by the aid of signs. It has bee contended by some writers that it can only be conducted by this agency; othe maintain that the use of signs is not indispensable and this is the more probabl opinion. But it is universally agreed that use of signs is a most important ai and that without them no extended process or reasoning could be conducted. "Now logic while it is the science of reasoning in general is in a more especia sense the science of reasoning by signs. It investigates the forms an expressions to which correct reasoning may be reduced and the laws upo which it is founded."
  – G. Boole, "The Nature of Logic," 1848, in I. Grattan-Guinness and G. Borne (Eds.), "George Boole – Selected Manuscripts on Logic and its Philosophy, Birkhauser Verlag, 1997.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "What we have to take for granted in Logic is, then, a duality, external an internal. On the one hand, outside us, there is the world of phenomen pursuing its course; and, on the other hand, within us, there is the observin and thinking mind. Logic is concerned with the judgments of the latter abou the former. The entire omission of either of these two elements, - if indee such were possible, - would involve the destruction of the science, as an undue stress upon either leads to confusion and to inconsistency."
  "Logic then as here conceived is neither a purely objective nor a purel subjective science. It involves both elements, consisting essentially in th relation of one to the other, and serious error results from the neglect of eithe aspect, and even from insufficient recognition of it."
  – J. Venn, "The Principles of Empirical or Inductive Logic," Macmillan, 188 Kessinger Publishing, 2004 (Reprint).
- "Logic has always made high claims as the scientia scientiarum, the science c sciences."
  – W. Minto, "Logic: Inductive and Deductive," C. Scribner's Sons, 189 Kessinger Publishing, 2004 (Reprint).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Philosophy seems to consist of two parts, Logic and Metaphysics. ..... Logic is the science of thought, not merely of thought as a psychic phenomenon but of thought in general laws and kinds. Metaphysics is th science of being, not merely as given in physical experience, but of being i general, its laws and types. Of the two branches of philosophy Logic somewhat more affiliated to psychics, metaphysics to physics."
  "Logic in the narrower sense is that science which concerns itself primaril with distinguishing probable reasonings into good and bad reasonings, and wit distinguishing probable reasonings into strong and weak reasoning Secondarily, logic concerns itself with all that it must study in order to dra those distinctions about reasoning, and with nothing else."
  – C. S. Peirce, "Reasoning and the Logic of Things – The Cambridg Conferences Lectures of 1898," K. L. Ketner (Ed.), Harvard University Pres 1992.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Symbolic Logic is the development of the most general principles of rational procedure, in ideographic symbols, and in a form which exhibits the connectio of these principles one with another."
  – C. I. Lewis, "A Survey of Symbolic Logic," University of California Pres 1918, Thoemmes Press, 2001.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "The essential purpose of logic is attained if we can analyse the various form of inference and arrive at a systematic way of discriminating the valid from th invalid forms."
  – M. R. Cohen and E. N. Nagel, "An Introduction to Logic and Scientifi Method," Routledge and Kegan Paul, 1934.
- "There is a special discipline, called logic, which is considered to be the bas for all other sciences, and where one aims to establish the precise meaning c such terms (as "not", "and", "or", "is", "every", "some", and many othe belong here) and to determine the most general laws which govern then Logic evolved into an independent science long ago, earlier even tha arithmetic and geometry."
  "Logic is treated primarily as a discipline which strengthens the foundations c mathematics."
  – A. Tarski, "Introduction to Logic and to the Methodology of the Deductiv Sciences," 1936(in Polish), Oxford University Press, 1941, 1946, 1965, 199 (4th Edition, Revised).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "The scope of the term 'logic' has varied widely from writer to writer throug the centuries. But these varying scopes seem all to enclose a common part: th logic which is commonly described, vaguely, as the science of necessar inference."
  – W. V. O. Quine, "Elementary Logic," Harvard University Press, 1941, 196 1980 (Revised Edition).
- "Logic, like any science, has as its business the pursuit of truth. What are tru are certain statements; and the pursuit of truth is the endeavor to sort out th true statements from the others, which are false."
  – W. V. O. Quine, "Methods of Logic," Harvard University Press, 1950, 195 1972, 1978, 1982 (4th Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is the study of the methods and principles used to distinguish goo (correct) from bad (incorrect) reasoning."
  "The aim of the study of logic is to discover and make available those criteri that can be used to test arguments for correctness."
  "The distinction between correct and incorrect reasoning is the central proble with which logic deals. The logician's methods and techniques have bee developed primarily for the purpose of making this distinction clear."
  – I. M. Copi and C. Cohen, "Introduction to Logic," Macmillan, 1953, 1961, M. Copi, 1968, 1972, 1978, 1982, 1986, Macmillan, 1990, Prentice-Hall, 199 (9th Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic has frequently been defined as the science of the laws of thought. Bu this definition, although it gives a clue to the nature of logic, is not accurate. I the first place, thinking is studied by psychologists. Logic cannot be "the science of the laws of thought, because psychology is also a science that deal with laws of thought (among other things). And logic is not a branch c psychology; it is a separate and distinct field of study. In the second place, "thought" refers to any process that occurs in people's minds, not all thought an object of study for the logician. All reasoning is thinking, but not a thinking is reasoning. …… To define 'Logic' as the science of the laws c thought is to make it include too much."
  – I. M. Copi and C. Cohen, "Introduction to Logic," Macmillan, 1953, 1961, M. Copi, 1968, 1972, 1978, 1982, 1986, Macmillan, 1990, Prentice-Hall, 199 (9th Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is sometimes defined as the science of reasoning. This definition much better, but it also will not do. Reasoning is a special kind of thinking i which problems are solved, in which inference takes place, that is, in whic conclusions are drawn from premises. It is still a kind of thinking, howeve and therefore still part of the psychologist's subject matter. …… The logician however, is concerned primarily with the correctness of the completed proces of reasoning. The logician asks: Does the conclusion reached follow from th premises used or assumed? If the premises do provide adequate grounds fc affirming the conclusion, if asserting the premises to be true does warrar asserting the conclusion also to be true, then the reasoning is correc Otherwise, it is incorrect."
  – I. M. Copi and C. Cohen, "Introduction to Logic," Macmillan, 1953, 1961, M. Copi, 1968, 1972, 1978, 1982, 1986, Macmillan, 1990, Prentice-Hall, 199 (9th Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is the study of the methods and principles used to distinguish correc reasoning from incorrect reasoning. There are objective criteria with whic correct reasoning may be defined. If these criteria are not known, then the cannot be used. The aim of the study of logic is to discover and make availabl those criteria that can be used to test arguments, and to sort good argument from bad ones."
  – I. M. Copi and C. Cohen, "Introduction to Logic," Macmillan, 1953, 1961, M. Copi, 1968, 1972, 1978, 1982, 1986, Macmillan, 1990, Prentice-Hall, 199 1998, 2002 (11th Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is concerned with the principles of valid inference."
  – W. Kneale and M. Kneale, "The Development of Logic," Clarendon Pres 1962, 1984 (Paperback Edition with Corrections).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Although logic is general regarded as a branch of philosophy, its application extend far beyond the limits of any single discipline. The critical standards c logic have application in any subject which employs inferences and argument in any field in which conclusions are supposed to be supported by evidence This includes every domain of serious intellectual endeavor as well as th practical affairs of everyday life."
  "Logic provides tools for the analysis of arguments. Logical analysis i concerned with the relationship between a conclusion and the evidence give to support it."
  "Logic deals with arguments and inferences. One of its main purposes is t provide methods for distinguishing those which are logically correct from thos which are not."
  "Logic is concerned with an objective relation between evidence an conclusion."
  – W. C. Salmon, "Logic," Prentice-Hall, 1963, 1973, 1984 (3rd Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "We open this inquiry (the nature of mathematical logic) by examining thre sense which the word 'logic' has in ordinary discourse."
  "The first sense is that intended when we say that 'logic is the analysis an criticism of thought.' We observe that we reason, in the sense that we dra conclusions from our data; that sometimes these conclusions are correc sometimes not; and that sometimes these errors are explained by the fact tha some of our data were mistaken, but not always; and gradually we becom aware that reasonings conducted according to certain norms can be depende on if the data are correct. The study of these norms, or principles of vali reasoning, has always been regarded as a branch of philosophy. In order t distinguish logic in this sense from other senses introduced later, we shall call philosophical logic."
  – H. B. Curry, "Foundations of Mathematical Logic," McGraw-Hill, 196 Dover Publications, 1977.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "In the study of philosophical logic it has been found fruitful to us mathematical methods, i.e., to construct mathematical systems having som connection therewith. ... The systems so created are naturally a prope subject for study in themselves, and it is customary to apply the term 'logic' t such a study. Logic in this sense is a branch of mathematics. To distinguish from other senses, it will be called mathematical logic."
  "In both of its preceding senses 'logic' was used as a proper name. The wor is also frequently used as a common noun, and this usage is a third sense of th word distinct from the first two. In this sense a logic is a system, or theory such as one considers in mathematical or philosophical logic."
  – H. B. Curry, "Foundations of Mathematical Logic," McGraw-Hill, 196 Dover Publications, 1977.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "One of the popular definitions of logic is that it is the analysis of methods c reasoning. In studying these methods, logic is interested in the form rather tha the content of the argument. …… The truth or falsity of the particula premises and conclusions is of no concern to logicians. They want to kno only whether the premises imply the conclusion. The systematic formalizatio and cataloguing of valid methods of reasoning are a main task of logicians."
  – E. Mendelson, "Introduction to Mathematical Logic," Chapman & Hal 1964, 1979, 1987, 1997 (4th Edition).
- "Formal logic studies the forms of human reasoning without paying attentio to their specific subject matter. It seeks the answer to the question, how do w reason?"
  – A. A. Stolyar, "Elementarnoye vvedeniye v matematicheskuyu logiku (i Russian)," Prosveshcheniye Press, 1965, "Introduction to Elementar Mathematical Logic," The MIT Press, 1970, Dover Publications, 1983.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic has the important function of saying what follows from what. ….. Logic is used in organizing scientific knowledge, and as a tool of reasoning an argumentation in daily life"
  – S. C. Kleene, "Mathematical Logic," John Wiley & Sons, 1967, Dove Publications, 2002.
- "Logic is the study of reasoning."
  – J. R. Shoenfield, "Mathematical Logic," Addison-Wesley, 1967, 1973 (2n printing), Association for Symbolic Logic, 2001 (reprinting).
- "Formal logic is the science of deduction. It aims to provide systematic mean for telling whether or not given conclusions follow from given premises, i.e whether arguments are valid or invalid."
  "If logic is the science of deduction, it is the science of refutation as wel From this point of view formal logic aims to provide systematic means fo recognizing inconsistency."
  – R. Jeffrey, "Formal Logic: Its Scope and Limits," McGraw-Hill, 1967, 198 1991 (3rd Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "In large part, deductive logic concerns what can legitimately be inferred fro what – i.e., whether a given statement would have to be true, or might still b false, if others offered as grounds for asserting it were true."
  "Logic treats other things as well: whether a given statement could be false a all, or is necessary true; whether, of two given statements, either one could b true and the other false; whether a number of statements could all be tru together; and so on. These things too depend on how statements are pu together, or are compounded from other statements."
  "Often, to be sure, the credibility of a conclusion is enhanced by premise which do not guarantee its truth. Inductive logic is the study of such argument and of the degree of support that their premises bestow on their conclusion: But in deductive logic, the question is not how well the premises of a argument support the conclusion, but whether or not they would absolutel preclude the falsehood, and hence ensure the truth, of the conclusion."
  – H. Leblanc and W. A. Wisdom, "Deductive Logic," Prentice-Hall, 197 1976, 1993 (3rd Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "A central concern of logic is to discriminate valid from invalid argument and formal logical systems, such as the familiar sentence and predicate calcul are intended to supply precise canons, purely formal standards, of validity."
  – S. Haack, "Philosophy of Logic," Cambridge University Press, 1978.
- "Logic deals with what follows from what. It is the systematic study of th fundamental principles that underlie correct, 'necessary' pieces of reasoning a these occur in proofs, arguments, inferences, and deductions."
  – J. A. Robinson, "Logic: Form and Function: The Mechanization of Deductiv Reasoning," Edinburgh University Press, 1979.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Traditionally, logic is said to be the art (or study) of reasoning."
  – D. van Dalen, "Logic and Structure, Springer-Verlag, 1980, 1983, 1994, 200 2008 (4th Edition).
- "Logic is concerned with truth and inferences; that is, with determining th conditions under which a proposition is true and the conditions under whic one proposition may be inferred or deduced from other propositions."
  – J. D. McCawley, "Everything that Linguists have Always Wanted to Kno about Logic* *but were ashamed to ask," The University of Chicago Pres 1981, 1993 (2nd Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic may be defined as the organized body of knowledge, or science, tha evaluates arguments."
  "The purpose of logic, as the science that evaluates arguments, is thus t develop methods and techniques that allow us to distinguish good argumen from bad."
  "The aim of logic is to develop a system of methods and principles that we ma use as criteria for evaluating the arguments of others and as guides i constructing arguments of our own."
  – P. J. Hurley, "A Concise Introduction to Logic," Wadsworth, 1982, 198 1988, 1991, 1993, 1997, 1999, 2003, 2005, 2008, 2012 (11th Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is primarily about inferring, about reasoning; in particular, it is th study of what constitutes correct reasoning."
  "Logic is concerned with the verbal expression of reasoning, since this is th only thing that is publicly ascertainable. The term that we will use for th verbal expression of reasoning is argument."
  "The only thing logic is concerned with is whether arguments are good or bac correct or incorrect. Logic is a normative enterprise; its job is to evaluat arguments."
  "Logic is concerned solely with whether the conclusion follows from th premises, and this is a matter of the form rather than of the truth, falsity, c content of an argument."
  – V. Klenk, "Understanding Symbolic Logic," Prentice-Hall, 1983, 1989, 199 2002 (4th Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic, it is often said, is the study of valid arguments. It is a systemati attempt to distinguish valid arguments from invalid arguments."
  – W. H. Newton-Smith, "Logic: An Introductory Course," Routledge & Kega Paul, 1985, Taylor & Francis e-Library, 2005 (Revised and corrected Edition).
- "Logic can be defined as the study of the principles of good reasoning. It purpose is to develop a science of reasoning involving the fundamenta concepts of argument, inference, truth, falsity, and validity, among other Logic is enormously important in all areas of human knowledge. It clarifies ou thinking and helps us evaluate the reasoning behind the claims people mak and the beliefs and theories that we encounter in life. Logic helps us t understand what our beliefs mean, how to express them clearly, and how the may be supported."
  – R. M. Johnson, "Fundamentals of Reasoning: A Logic Book," Wadsworth 1987, 1992, 1998, 2002 (4th Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is the study of correct reasoning. Logic pertains to all subjects, sinc people can reason about anything they can think about. …… Using logic, w can evaluate bits of reasoning as proper or improper, good or bad. Logic is nc the study of how people do reason, but how they should reason. …… Logi describes not the psychological process of reasoning but the rules for correc reasoning. Logic does not describe real reasoning, with its errors, omission and oversights; it prescribes methods for justifying reasoning; that is, fc showing that a given bit of reasoning is proper. Logic thus describes an idea that actual reasoning strives for but sometimes fails to reach."
  – D. Bonevac, "Deduction: Introductory Symbolic Logic," Mayfield Publishin 1987, Blackwell, 2003 (2nd Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "The logician's concern is with validity, with the relation of consequenc between premises and conclusion. In order to justify an assertion, we ma adduce other statements, from which we claim the assertion follows. But wha is the criterion by which to decide if the conclusion really does follows? Th question has two aspects: concretely, to decide in particular cases whether th conclusion follows from the premises - in technical language, whether consequence relation holds; and abstractly, to understand in general what th relation between premises and conclusion in a valid argument is."
  "The purpose of logical theory is to provide an explanation of the validity an invalidity of argument. The goal is to describe the relation which must hol between premises and conclusion for it to be correct to say that the premise entail the conclusion, that the conclusion follows from the premises, or that th inference from premises to conclusion is valid."
  – S. Read, "Relevant Logic: A Philosophical Examination of Inference," Bas Blackwell, 1988.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is the study of arguments. An argument is a sequence of statements c which one is intended as a conclusion and the others, the premises, ar intended to prove or at least provide some evidence for the conclusion."
  "The purpose of logic is precisely to develop methods and techniques to te good arguments from bad ones."
  – J. N. Nolt, D. Rohatyn, and A. Varzi, "Schaum's Outline of Theory an Problems of Logic," McGraw-Hill, 1988, 1998 (2nd Edition).
- "Logic may be said to be the study of correct and incorrect reasoning. Thi includes the study of what makes arguments consistent or inconsistent, valid c invalid, sound or unsound. It has two branches, known as formal (symbolic logic and philosophical logic."
  – S. Wolfram, "Philosophical Logic: An Introduction," Routledge, 1989.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is the study of formal (that is symbolic) systems of reasoning and c methods of attaching meaning to them."
  – S. Reeves and M. Clarke, "Logic for Computer Science," Addison-Wesley 1990.
- "Logic has been conceived as the science of valid inference."
  – J. P. Cleave, "A Study of Logics," Oxford University Press, 1991.
- "Logic, one might say, is the science of reasoning. Reasoning is somethin which has various applications, and important among these traditionally i argumentation. The trains of reasoning studied in logic are still calle arguments, or argument schemata, and it is the business of logic to find ou what it is that makes a valid argument (or a valid inference) valid."
  – L. T. F. Gamut, "Logic, Language, and Meaning," The University of Chicag Press, 1991.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "The Science of Logic is the formal study of reasoning. Logic is a scienc because it aims to offer a systematic account of reasoning – chiefly what i known as deductive reasoning. It is formal because, unlike an empirica science such as psychology, logic does not study the beings who do th reasoning or their thought processes but the structure of reasoning itsel Formal logic is sometimes described as a preparation for other studies."
  – F. D. Portoraro and R. E. Tully, "Logic with SYMLOG: Learning Symboli Logic by Computer," Prentice-Hall, 1994.
- "Logic is the study of the distinction between valid and invalid arguments."
  – G. Forbes, "Modern Logic: A Text in Elementary Symbolic Logic," Oxfor University Press, 1994.
- "Logic is the study of how to reason, how to deduce from hypotheses, how t demonstrate. Logic is concerned with providing symbolic models c acceptable reasoning."
  – R. L. Epstein, "Predicate Logic," Oxford University Press, 1994.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logical consequence is the central concept in logic. The aim of logic is t clarify what follows from what, to determine which are the valid consequence of a given set of premises or assumptions. The consequence relation relates set or collection of given propositions to those propositions or conclusion which correctly, or validly, follow from them. We can say that the premise entail the conclusion; or that the conclusion (validly) follows from th premises; or that one may correctly infer the conclusion from the premises; c that the conclusion is a (valid) logical consequence of the premises; or that th argument or inference from premises to conclusion is valid."
  – S. Read, "Thinking about Logic: An Introduction to the Philosophy c Logic," Oxford University Press, 1994.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is the study of the relations of logical consequence, that is, of relation of implication or entailment. Its concrete manifestation is an ability to perfor logical inferences, that is, to draw deductive conclusions."
  – J. Hintikka, "The Principles of Mathematics Revisited," Cambridg University Press, 1996.
- "In general, logic is about reasoning. It is about the validity of argument consistency among statements (or propositions, as they're called in logic) an matters of truth and falsehood. In a formal sense logic is concerned only wit the form of an arguments and the principles of valid inferencing. It is nc science – it is not concerned with the content of reasoning. It deals with th notion of truth in an abstract sense."
  – J. Kelly, "The Essence of Logic," Prentice-Hall, 1997.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic was one of the first scientific disciplines to be identified and studie systematically."
  – C. Howson, "Logic with Trees: An Introduction to Symbolic Logic, Routledge, 1997.
- "The word logic derives from the Greek λογοσ: reasoning, and is defined i the OED as the:
  (a) branch of philosophy that deals with reasoning and thinking, especiall inference and scientific method;
  (b) systematic use of symbolic techniques and mathematical methods t determine the forms of valid deductive argument.
  These definitions nicely illustrate the two-way traffic between logic an mathematics. Thus, according to (a), logic underpins mathematics. On th other hand, (b) declares that mathematical ideas, notation and methods can b used to describe and develop the study of logic."
  – D. L. Johnson, "Elements of Logic via Numbers and Sets," Springer, 1998.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic studies the notion(s) of consequence. It deals with proposition (sentences), sets of propositions and the relation of consequence among then The task of formal logic is to represent all this by means of well-defined logica calculi admitting exact investigation. Various calculi differ in their definition of sentences and notion(s) of consequence."
  – P. Hajek, "Metamathematics of Fuzzy Logic," Kluwer Academic, 1998.
- "Logic is the study of reasoning. Aristotle (384-322 B.C.) founded logic as system of principles upon which all other knowledge rests. Logic pertains to a subjects; people can reason about anything. Sometimes the reasoning is gooc Sometimes it is not. People use logic to tell the difference."
  "Logic is not the study of how people do reason but how they should reasor ……Logic describes an ideal that actual reasoning sometimes fails to reach .
  – D. Bonevac, "Simple Logic," Harcout Brace College Publishers, 1999.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Although it may differ in form from one scientific discipline to another, logi lies at the heart of every such discipline: physicists use logic with extensive us of symbols and proofs and biologists with a less formal form of reasoning Logic makes such disciplines scientific, by providing a way to deduce the vas amount of knowledge in each discipline from a relatively small number c explicitly stated facts or hypotheses. In order to make this kind of deductior logic can be treated as a language, and this allows, first, the expression c knowledge concisely and precisely and, secondly, a way to reason about th consequences of knowledge rigorously."
  – N. Nissanke, "Introductory Logic and Sets for Computer Scientists," Addiso Wesley, 1999.
- "To study logic is to study argument. Argument is the stuff of logic. ….. Argument itself is the subject-matter of logic. The central problem whic worries the logician is just this: how, in general, can we tell good argument from bad arguments? Modern logicians have a solution to this problem whic is incredibly successful and enormously impressive."
  – P. Tomassi, "Logic," Routledge, 1999.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Roughly speaking, logic is the study of methods for evaluating arguments More precisely, logic is the study of methods for evaluating whether th premises of an argument adequately support (or provides good evidence for) it conclusion."
  – C. S. Layman, "The Power of Logic," Mayfield, 1999, 2002, McGraw-Hil 2005 (3rd Edition).

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is the study of what counts as a good reason for what, and why."
  – G. Priest, "Logic: A Very Short Introduction," Oxford University Press, 200(
- "Logic is about consequences. Take a body of propositions. The job of a logi is to tell you what follows from that body of propositions."
  – G. Restall, "An Introduction to Substructural Logics," Routledge, 2000.
- "Logic is the theory of consequence relations, of valid inferences."
  – L. Goble, "The Blackwell Guide to Philosophical Logic," Blackwell, 2001.
- "Logic is quite simply the study of truth-preserving arguments."
  – D. Cryan, S. Shatil, and B. Mayblin, "Introducing Logic," Icon Books, 2001.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is the collective name for the principles of correct reasoning. Th study of logic investigates these principles and identifies the general rules tha distinguish good from bad reasoning. …… Logic, in contrast (to tha Psychology is a descriptive empirical study), is a prescriptive abstract stud like mathematics that seeks to establish rules for correct reasoning and to hel thinkers avoid mistaken reasoning. The purpose of logic is to discover an justify principles that offer the best account of reasoning as it should ideall occur."
  – D. Jacquette, "Symbolic Logic," Wadsworth, 2001.
- "Logic is about reasoning – about going from premises to a conclusion. ….. Logic is the analysis and appraisal of arguments. When you do logic, you tr to clarify reasoning and separate good from bad reasoning."
  – H. J. Gensler, "Introduction to Logic," Routledge, 2002, 2010 (2nd Edition).
- "The whole point of the logic we shall develop is to provide a tool for doin mathematics and philosophy (in other words, thought)."
  – M. J. Gabbay, "Logic With Added Reasoning," Broadview Press, 2002.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "The business of logic is the systematic evaluation of arguments for interna cogency. And the kind of internal cogency that will especially concern us deductive validity."
  – P. Smith, "An Introduction to Formal Logic," Cambridge University Pres 2003.
- "Logic is the theory of good reasoning. Studying logic not only helps you t reason well, but it also helps you understand how reasoning works. Logic ca be done in two ways – it can be formal and it can be philosophical."
  – G. Restall, "Logic: An Introduction," Routledge, 2006.
- "It is far from clear what is meant by logic or what should be meant by it. It nevertheless reasonable to identify logic as the study of inferences an inferential relations. The obvious practical use of logic is in any case to help u to reason well, to draw good inferences. And the typical form the theory c any part of logic seems to be a set of rules of inference."
  – J. Hintikka and G. Sandu, "What is Logic?" in D. Jacquette (Ed. "Philosophy of Logic," Elsevier B. V., 2007.

Logic: What Is It? – Definitions of 'Logic' by Logicians

- "Logic is the study of correct reasoning. The study of correct reasoning is th most important study there can be. Therefore, logic is the most importar study there can be."
  – A. vander Nat, "Simple Formal Logic: With Common-Sense Symboli Techniques," Routledge, 2010.

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "Mathematical logic, also call symbolic logic or logistic, is an extension of th formal method of mathematics to the field of logic. It employs for logic symbolic language like that which has long been in use to express mathematica relations."
  "The purpose of the symbolic language in mathematical logic is to achieve i logic what it has achieved in mathematics, namely, an exact scientifi treatment of its subject-matter. "
  – D. Hilbert and W. Ackermann, "Principles of Mathematical Logic, (Translation into English of the second Edition of the "Grundzuge de Theoretischen Logik") Julius Springer, 1928, 1938, Chelsea Publishin Company, 1950.

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "Mathematical Logic, which is nothing else but a precise and complet formulation of formal logic, has two quite different aspects. On the one hanc it is a section of Mathematics, treating of classes, relations, combinations c symbols, etc. instead of numbers, functions, geometric figures, etc. On th other hand, it is a science prior to all others, which contains the ideas an principles underlying all sciences. It was in the second sense tha Mathematical Logic was first conceived by Leibniz in his Characteristic universalis, of which it would have formed a central part."
  – K. Gödel, "Russell's Mathematical Logic," in Schilpp (Ed.) "The Philosoph of Bertrand Russell," Open Court Publishing Company, 1944.
- "Traditionally, (formal) logic is concerned with the analysis of sentences or c propositions and of proof with attention to the forms in abstraction from th matter."
  – A. Church, "Introduction to Mathematical Logic," Annals of Mathematic Studies, 1944, Princeton University Press, 1956.

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "Mathematical or symbolic logic has two aspects. On one hand it is logic – is an analytical theory of the art of reasoning whose goal is to systematize an codify principles of valid reasoning. The other aspect of symbolic logic interlaced with problems relating to the foundations of mathematics. In brief, amounts to formulating a mathematical theory as a logical system augmente by further axioms."
  – R. R. Stoll, "Set Theory and Logic," W. H. Freeman and Company, 196 1963, Dover Publications, 1979.

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "In the study of philosophical logic it has been found fruitful to us mathematical methods, i.e., to construct mathematical systems having som connection therewith. ... The systems so created are naturally a prope subject for study in themselves, and it is customary to apply the term 'logic' t such a study. Logic in this sense is a branch of mathematics. To distinguish from other senses, it will be called mathematical logic."
  – H. B. Curry, "Foundations of Mathematical Logic," McGraw-Hill, 196 Dover Publications, 1977.
- "The systematic formalization and cataloguing of valid methods of reasonin are a main task of logicians. If the work uses mathematical techniques or if it primarily devoted to the study of mathematical reasoning, then it may be calle mathematical logic. We can narrow the domain of mathematical logic if w define its principal aim to be a precise and adequate understanding of th notion of mathematical proof."
  – E. Mendelson, "Introduction to Mathematical Logic," Van Nostrand, 196 1979, 1987, Chapman & Hall, 1997 (4th Edition).

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "Mathematical logic (also called symbolic logic) is logic treated b mathematical methods. Logic has the important function of saying wha follows from what. Every development of mathematics makes use of logic."
  – S. C. Kleene, "Mathematical Logic," John Wiley & Sons, 1967, Dove Publications, 2002.
- "Logic is the study of reasoning; and mathematical logic is the study of th type of reasoning done by mathematicians."
  – J. R. Shoenfield, "Mathematical Logic," Addison-Wesley, 1967, 1973 (2n printing), Association for Symbolic Logic, 2001 (reprinting).
- "Truth-functional logic is the science of tautology."
  – R. Jeffrey, "Formal Logic: Its Scope and Limits," McGraw-Hill, 1967, 198 1991 (3rd Edition).

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "Symbolic logic is a mathematical model of deductive thought."
  – H. B. Enderton, "A Mathematical Introduction to Logic," Academic Pres 1972, 2001 (2nd Edition).

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "It is a familiar misconception to believe that to do mathematical logic is to b engaged primarily in formal thinking. The important point is rather to mak precise the concept of formal and thereby be able to reason mathematicall about formal systems. And this adds a new dimension to mathematics."
  – H. Wang, "Popular Lectures on Mathematical Logic," Van Nostran Reinhold, 1981, Dover Publications, 1993.
- "Logic is concerned mainly with two concepts: truth and provability."
  – J. H. Gallier, "Logic for Computer Science: Foundations of Automati Theorem Proving," Harper & Row, 1986, 2003, Dover Publications, 2015 (2n Edition).
- "The function of mathematical logic is to provide formal languages fc describing the structures with which mathematicians work, and the methods c proof available to them."
  – P. T. Johnstne, "Notes on Logic and Set Theory," Cambridge Universit Press, 1987.

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "In the family of formal logics, one is central: classical logic. It is the mos widely used logic, the logic underlying mathematics as it is generally practicec and the logic on top of which many others have been built."
  "In fact, classical logic was created to embody the reasoning principles c mathematics, where ambiguity and imprecision are a bad thing."
  "Classical logic can be used to reason correctly about such a model. Whethe the model accurately reflects the real world is a separate issue."
  "In classical logic we investigate the principles of reasoning for perfect worlds where truth is unqualified and there are no shades of grey."
  – M. Fitting, "First-Order Logic and Automated Theorem Proving," Springe 1990, 1996 (2nd Edition).

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "The study of logic was begun by the ancient Greeks whose educationa system stressed competence in philosophy and rhetoric. Logic was used t formalize deduction: the derivation of true statements, called conclusions, fror statements that are assumed to be true, called premises."
  "We still use many Greek words in logic such as axiom and theorem, but unt the nineteenth century, logic remained a philosophical, rather than mathematical and scientific, tool, perhaps because it lacked a sufficientl developed symbolic notation."
  "Mathematicians revived the study of logic in order to study the foundations c mathematics."
  "While mathematical logic remains an important branch of pure mathematics it is being extensively applied in computer science. In turn, the application c logic to computer science has spurred the development of new systems c logic."
  – M. Ben-Ari, "Mathematical Logic for Computer Science," Prentice-Hal 1993, Springer, 2001 (2nd Edition).

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "Even though the study of 'logic' has been in existence since the earliest day of scientific thinking, the general view of mathematical logic has change significantly over the last 50 years or so. Logic used to be a topic studied b pure mathematicians, and its objective was the ability to construct proofs abou the foundations of mathematical theory. Logic was used to find the minimur number of assumptions which were necessary to produce all the mathematica theory in a given area. Most people would still consider logic as a part of 'pur Mathematics' rather than 'Applied Mathematics'. However, the advent of th computer has led to some very important real-world applications. As wit many such development, this has in turn led to extensive new areas of theory and the new development associated with logic are essential to any moder logician."
  – E. Burke and E. Foxley, "Logic and its Applications," Prentice-Hall, 1996.
- "The most fundamental notion in classical logic is that of truth."
  – D. Bostock, "Intermediate Logic," Oxford University Press, 1997.

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "In 1920 logic was mostly a philosophers's garden. There were also a fe mathematicians there, cultivating the logical roots of the mathematical tree. Toda Recursion Theory, Set Theory, Model Theory and Proof Theory, logic's maj subdisciplines, have become full-fledged branches of mathematics."
  "The emerging areas with an important logic component include imperativ declarative and functional programming; verification of programs; interactiv concurrent, distributed, fault tolerant and real time computing; knowledge-base systems; deductive databases; and VLSI design. Various types of logic are now als playing key roles in the modeling of reasoning in special fields from law t medicine."
  "These applications have widened the horizons of logical research to encompas problems and ideas that were not even considered when logic was motivated only b questions from mathematics and philosophy. Applied logic is now as much a realit as is applied mathematics."
  "Mathematical logic, coupled with some of its applications, should be as easil available to college and university students as is applied mathematics."
  – A. Nerode and R. A. Shore, "Logic for Applications," Springer, 1997 (2nd Edition

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "The aim of logic in computer science is to develop languages to model th situations we encounter as computer science professionals, in such a way tha we can reason about them formally. Reasoning about situations mean constructing arguments about them; we want to do this formally, so that th arguments are valid and can be defended rigorously, or executed on machine."
  – M. Huth and M. Ryan, "Logic in Computer Science: Modelling an Reasoning about Systems," Cambridge University Press, 2000, 2004 (2n Edition).

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "In its first meaning, a logic is a collection of closely related artificia languages. There are certain languages called first-order languages, an together they form first-order logic."
  "In its second but older meaning, logic is the study of the rules of soun argument. First-order languages can be used as a framework for studying rule of argument; logic done this way is called first-order logic."
  – W. Hodges, "Classical Logic I: First-Order Logic," in L. Goble (Ed.), "Th Blackwell Guide to Philosophical Logic," Blackwell Publishers, 2001.
- "Logic is the science of reasoning. Mathematical logic applies t mathematical reasoning – the art and science of writing down deductions."
  – G. Tourlakis, "Lectures in Logic and Set Theory, Volume 1: Mathematica Logic," Cambridge University Press, 2003.

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "One set of rules for reasoning was laid down by the ancient Greeks over tw thousand years ago. They called this system of reasoning 'logic'. This logi forms the basis of reasoning throughout much of Western civilization. should be noted, however, that the term logic is often applied to any system c reasoning; in such circumstances, the term classical logic may then be used t refer to the logic of the ancient Greeks."
  "Until the nineteenth century, reasoning was purely verbal and used norma everyday language; we shall refer to such language as natural language. Sinc then, much progress has been made on developing symbolic logic in whic information is represented using letters and special symbols, rather like algebra Symbolic logic enables a certain degree of automation of reasoning; indeed, it original motivation was a desire to be able to decide a logical problem b 'calculation', just as the answer to a numerical problem can be calculated usin arithmetic."
  – N. Dean, "Logic and Language," Palgrave Macmillan, 2003.

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "A logic is a language equipped with rules for deducing the truth of on sentence from that of another."
  "Logic is defined as the study of the principles of reasoning. The study c logics (as defined above) is the part of this study known as symbolic logi Symbolic logic is a branch of mathematics. "
  "A century ago, the primary aim of symbolic logic was to provide a foundatio for mathematics. Today, foundational studies are just one part of symboli logic."
  "Symbolic logic views mathematics and computer science from a uniqu perspective and supplies distinct tools and techniques for the solution of certai problems."
  – S. Henman, "A First Course in Logic: An introduction to model theory, proc theory, computability, and complexity," Oxford University Press, 2004.

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "Why should students of mathematics want to know something abou predicate logic? Here is one answer: predicate logic helps one understand th fine points of mathematical language, including the ambiguities that arise fro the use of natural language (English, French, etc.) in mathematics."
  "The study of logic and the foundations of mathematics has led to man powerful and versatile methods, and many deep and beautiful results. Some c these methods and results are relevant within foundations only, but many c them are useful and important in other branches of mathematics and in field outside of mathematics."
  – R. S. Wolf, "A Tour through Mathematical Logic," The Mathematica Association of America, 2005.

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "Traditional logic as a part of philosophy is one of the oldest scientifi disciplines. It can be traced back to the Stoics and to Aristotle and is the roc of what is nowadays called philosophical logic. Mathematical logic, howeve is a relatively young discipline, having arisen from the endeavors of Peanc Frege, and Russell to reduce mathematics entirely to logic. It steadil developed during the twentieth century into a broad discipline with severa subareas and numerous applications in mathematics, computer scienc linguistics, and philosophy."
  – W. Rautenberg, "A Concise Introduction to Mathematical Logic," Springe 2006, 2010 (3rd Edition).

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "One feature of modern logic is a clear distinction between object languag and metalanguage. The first is formalized or at least formalizable. The latter i like the language of this book, a kind of a colloquial language that differs fro author to author and depends also on the audience the author has in mind. It mixed up with semiformal elements, most of which have their origin in s theory. The amount of set theory involved depends on one's objective Traditional semantics and model theory as essential parts of mathematical logi use stronger set-theoretic tools than does proof theory. In some mode theoretic investigations these are often the strongest possible ones. But o average, little more is assumed than knowledge of the most common se theoretic terminology, presented in almost every mathematical course c textbook for beginners."
  – W. Rautenberg, "A Concise Introduction to Mathematical Logic," Springe 2006, 2010 (3rd Edition).

Mathematical Logic: What Is It? – Definitions of 'Mathematical Logic' by Mathematical Logicians

- "The main objects of study of mathematical logic are mathematical theorie such as set theory, number theory, and the theory of algebraic structures suc as groups, rings, fields, algebraically closed fields, etc., with the aim to develo tools to examine their consistency, completeness, and other similar questio concerning the foundation of these theories."
  – S. M. Srivastava, "A Course on Mathematical Logic," Springer, 2008.