Discrete math

Science, Mathematics

Propositions The fundamental objects we work with In arithmetic are numbers. In a similar way, the fundamental objects In logic are propositions. Definition: A proposition Is a statement that is either true or false. Whichever of these (true or false) is the case is called the truth value of the proposition. Here are some examples of English sentences that are propositions: 'Canberra is the capital of Australia. ' 'There are 8 days in a week. ' 'Isaac Newton was born In 1642. ' '5 Is greater than 7. Every even number greater than 2 can be expressed as the sum of two prime numbers. ' The following sentences are not propositions: Where are you going? 'Come here. ' 'This sentence Is false. ' Explanation The first sentence is a question and the second is a command, so clearly neither is a proposition and the third sentence is rather more subtle. The study of the structure of compound propositions is made easier by the use of symbols for atomic propositions and connectives.

We will use lower-case letters such as p, q and r to denote atomic propositions. There are five connectives that we will use in our work: they are listed in Table, together with their symbols. The If then and if and only if connectors will be our next topic on Monday. Express the following propositions in symbolic form, and Identify the principal connective: (a) Either Karen Is studying computing and Mini Is not studyingmathematics, or Mini Is studying mathematics.) It Is not the case that If It Is sunny then I will carry an umbrella. (c) The program will terminate if and only if the input is not numeric or the escape key is pressed.