

Elementary Inequality – Bất Đẳng Thức Sơ Cấp

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Tóm tắt nội dung

Mục lục

1	Introduction to Inequality	2
1.1	Properties on the number line \mathbb{R}	2

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1 Introduction to Inequality

Definition 1 (Inequality). “In mathematics, an inequality is a relation which makes a non-equal comparison between 2 numbers or other mathematical expressions.

It is used most often to compare 2 numbers on the **number line** by the size. There are several different notations used to represent different kinds of inequalities: The notation $a < b$ means that a is *less than* b . The notation $a > b$ means that a is *greater than* b . In either case, a is not equal to b . These relations are known as *strict inequalities*, meaning that a is strictly less than or strictly greater than b . Equivalence is excluded.

In contrast to strict inequalities, there are 2 types of inequality relations that are not strict: The notation $a \leq b$ means that a is *less than or equal to* b (or, equivalently, at most b , or not greater than b). The notation $a \geq b$ means that a is *greater than or equal to* b (or, equivalently, at least b , or not less than b).

The relation *not great than* can also be represented by $a \not> b$, the symbol for “greater than” bisected by a slash, “not”. The same is true for *not less than* & $a \not< b$.

The notation $a \neq b$ means that a is not equal to b ; this **inequation** sometimes is considered a form of strict inequality. It does not say that one is greater than the other; it does not even require a, b to be member of an **ordered set**.

In engineering science, less formal use of the notation is to state that 1 quantity is “much greater” than another, normally by several **orders of magnitude**. The notation $a \ll b$ means that a is *much less than* b . The notation $a \gg b$ means that a is *much greater than* b . This implies that the lesser value can be neglected with little effect on the accuracy of an **approximation** (e.g., the case of **ultrarelativistic limit** in physics).

In all of the cases above, any 2 symbols mirroring each other are symmetrical; $a < b$ & $b > a$ are equivalent, etc.” – [Wikipedia/inequality \(mathematics\)](#)

1.1 Properties on the number line \mathbb{R}