



Why

We want to order the integers.

Definition

Consider $[(a, b)], [(b, c)] \in \mathbf{Z}$. If $a + d < b + c$, then we say that $[(a, b)]$ is *less than* $[(b, c)]$.¹ If $[(a, b)]$ is less than $[(b, c)]$ or equal, then we say that $[(a, b)]$ is *less than or equal to* $[(b, c)]$.

Notation

If $x, y \in \mathbf{Z}$ and x is less than y , then we write $x < y$. If x is less than or equal to y , we write $x \leq y$.

Positive and Negative Integers

We call an integer z *positive* if $z > 0$ and we call z *negative* if $z < 0$.² We call an integer z *nonnegative* if $z > 0$ or $z = 0$ and *nonpositive* if $z < 0$ or $z = 0$.

Notation

We denote the set $\{z \in \mathbf{Z} \mid z \geq 0_Z\}$ by \mathbf{Z}_{++} .

¹One needs to show that this is well-defined. The account will appear in future editions.

²Some authors use the term positive for the case when $z > 0$ or $z = 0$. We use the term nonnegative in this case.

