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Archimedean semigroup

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Let S be a commutative semigroup. We say an element x *divides* an element y , written $x \mid y$, if there is an element z such that $xz = y$.

An *Archimedean semigroup* S is a commutative semigroup with the property that for all $x, y \in S$ there is a natural number n such that $x \mid y^n$.

This is related to the Archimedean property of positive real numbers \mathbb{R}^+ : if $x, y > 0$ then there is a natural number n such that $x < ny$. Except that the notation is additive rather than multiplicative, this is the same as saying that $(\mathbb{R}^+, +)$ is an Archimedean semigroup.