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A subsemigroup of the additive semigroup of positive integers \mathbb{P} which generates the group of integers \mathbb{Z} as a group bears the label of numerical. The category of numerical semigroups and homomorphisms is compared with several categories. The relationship turns out to be either isomorphism or equivalence of categories. These categories have objects of diverse nature: subsemigroups of \mathbb{P} , abstract semigroups satisfying strong conditions, partial orders on \mathbb{Z} , infinite cyclic groups partially ordered, pairs of the form (r, I) where $r \in \mathbb{P}$ and I is a $r \times r$ -matrix over nonnegative integers \mathbb{N} , functions from $\mathbb{Z}/(r)$ into \mathbb{N} , all of these satisfying numerous conditions. This is an “external” study of numerical semigroups: comparison with different objects which may shed some light on their own structure.

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