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Quasi-automatic semigroups

A *quasi-automatic semigroup* is a finitely generated semigroup with a rational set of representatives L such that the graph of right multiplication by a generator on the set L is a rational relation. We present here three results on that newly defined class of semigroups. First, we show that the word problem of such a semigroup is decidable in exponential time. We then show that a generalised form of the Lipschitz property of automatic semigroups holds for quasi-automatic semigroups. Finally, we show that a quasi-automatic semigroup which happens to be a group has a finite presentation along with an exponential isoperimetric inequality.