Title:	The Cyclicity Question
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Abstract:	Division algebras and cyclic algebras are examples of, what are called, central simple algebras. The theory of central simple algberas has deep connections with number theory, K-theory and geometry. We aim to investigate conditions under which a given division algebra is cyclic. This is called cyclicity problem. Is every division algebra over a field cyclic? The cyclicity question in its naive form has a negative answer. As we will see an explicit example of degree four noncyclic division algebra over a formally real pythagorean field. Infact, there also exists cyclic algebras which are not division. The existence of a noncyclic division algebra confirms an intimate relationship between underlying field and the structure of a division algebra. We will see that division algebras of degree two and three are cyclic. As a consequence of primary decomposition theorem, degree six division algebras are also cyclic. In many cases after putting conditions on the field, all division algebra become cyclic. For instance, any division algebra over a global field, i.e., a finite extension of rational numbers or a global function fields, is always cyclic. There are still many open questions in this area.
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