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2-pile Nim is a game well-known to many people, which may be appropriate even for gifted 7th graders. K-pile Nim is a natural generalization of it. There is a less known possible follow-up to the 2-pile version, called Wythoff’s Nim. We usually pose this problem to gifted students of 9-10th grades. Most of them discover the recursive method for finding the losing positions. Finding an explicit formula for the set of losing positions is essentially more challenging. It is indeed not evident even to conjecture, while proving appears to be absolutely difficult. For solving this problem, students need to step out of the comfort zone determined by the task. This step prepares the moment when we need to step out of the world of real numbers for solving cubic equations. This is an extraordinarily difficult idea, and there a non-existent world had to be created. We have a bit easier situation here, as we do not need to create a non-existent world, however, we need to step out of the world of integers, into the world of real numbers, needing irrationals too. This is quite surprising for students, who do not expect, before, this need for leaving the familiar and friendly world of integers in order for working out the solution. (Received February 27, 2020)