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## AN EXTENDED PROBLEM TO BERTRAND'S PARADOX

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### Abstract

Bertrand's paradox is a longstanding problem within the classical interpretation of probability theory. The solutions  $1/2$ ,  $1/3$ , and  $1/4$  were proposed using three different approaches to model the problem. In this article, an extended problem, of which Bertrand's paradox is a special case, is proposed and solved. For the special case, it is shown that the corresponding solution is  $1/3$ . Moreover, the reasons of inconsistency are discussed and a proper modeling approach is determined by careful examination of the probability space.

**Keywords:** probability space, probability theory, problem modeling, random chords.

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