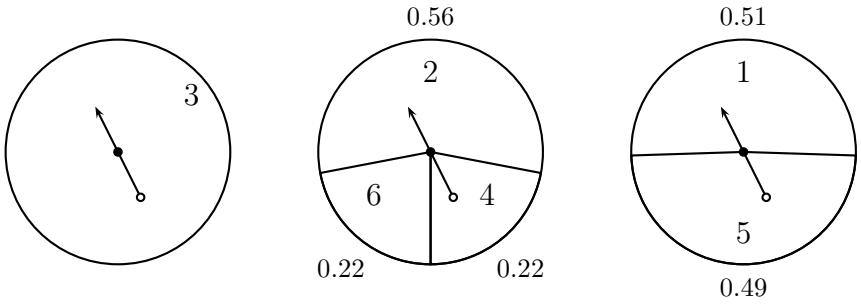
Épreuve de section européenne

Colin R. Blyth's paradox

Two people are playing a game with the three spinners shown below.



- Spinner A offers only one possible outcome : the value 3.
- With spinner B there are three possible outcomes : 2 with a probability of 0.56, 4 with a probability of 0.22 and 6 with a probability of 0.22.
- With spinner C there are two possible outcomes : 1 with a probability of 0.51 and 5 with a probability of 0.49.

Each player picks a spinner and flicks the arrow, and the highest number wins. The question is simply to decide what spinner to choose in order to maximize the chances of winning.

It's clear that spinner A wins over spinner B with a probability of 0.56, and over spinner C with a probability of 0.51. Spinner B beats spinner C with a probability of 0.6178.

Adapted from *The Colossal Book of Mathematics*, by Martin Gardner.

Questions

1. Compute the angle in degrees of each wedge of spinners B and C.
2. Explain the probabilities given in the last paragraph of the text.
3. What seem to be the best choice and the worst choice ?
4. Suppose now that 3 players play the game at the same time, each one choosing one spinner. Compute the probability of each spinner winning. What seem to be the best choice and the worst choice in this new situation ?