JMM 2026 – Metron's Daily Math Problems – Sheet D (Wednesday, January 7)

The final day's problems have no easy solutions. Just some food for thought until we meet next year in Chicago.

D1) The Sleeping Beauty problem is infamous for not having a universally accepted solution but rather rival schools of thought. The two main schools are the "thirders" (she is equally likely to be in any of the three awakenings) and the "halfers" (it was 1/2 before it was flipped, and awakening provides no new information).

D2) The Bertrand paradox is 100 years older than the Sleeping Beauty problem and has the same solution: "Maybe 1/3. Maybe 1/2. Maybe something else." What does "choosing a chord from a circle at random" mean? It there a principle that establishes what the most "natural" meaning is?

D3) This is the Bulgarian solitaire problem popularized by Martin Gardner. Unlike (D1) and (D2), there is an unambiguous solution, but it is too involved to recap here. Cf. "Revisiting Toom's Proof of Bulgarian Solitaire".