Thus the probability of getting no swap tends to $1/e$ as $n$ tends to infinity. If the same analysis is carried out for $4n$ cards ($n$ sets of 4), a similar, but messier, calculation shows that the probability of no snap tends to $1/e^3 = 0.0498 \ldots$ as $n$ tends to infinity. This value is very different from the probability $0.01623 \ldots$ obtained in the case $n = 13$ of a similar but essentially different matching problem posed as Problem 73.F in the October 1989 Gazette.

References

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76.6 On the scalar triple product and determinantal products

The purpose of this note is to comment on F. Gerrish's note, published with the same title in the Gazette of December 1988. A confirmation of the multiplication rule for third order determinants was obtained by extending a prior note by H.B. Davies in the Gazette of December 1987. Gerrish's use of a Cartesian base to effect a second expansion could leave the reader with the impression that the resultant rule depended in an essential way on the use of such a base. Any interested reader can verify that the rule is more general, and that it follows immediately from effecting Gerrish's second expansion using any set of linearly independent vectors.

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76.7 A drawbridge in balance

Recently in the Gazette of June 1990, 124–127, Martyn Cundy described the curve that a counterbalance weight for a drawbridge must follow in order to be in equilibrium in all possible positions. The curve is a cardioid. The photograph below shows one such bridge. It was taken in Australia in 1976. My notes on the photograph only say "Kyalite River", and as I remember it was near the point where South Australia, New South Wales and Victoria meet.