Math-O-Trick

NISER Open Day

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Let x be the position of the card, from the top in a face down pack of n cards, that is left after performing the said procedure. Then

$$x = 2n - 2^{\lfloor \log_2 n \rfloor + 1} + 1$$

where $\lfloor m \rfloor$ denotes the largest integer not greater than m.

Permutation is a rearrangement of objects from a given collection and every permutation can be reversed in a unique way. The collection here consists of 13 cards of spades and the procedure is the reverse of a permutation.

If 142857 is multiplied by any integer from 2 through 6, the result will contain the same digits as in 142857, in the same cyclic order.

There is always a way to arrange a pack of $n(n+1)$ cards, divided into pairs and placed in n rows of $n+1$ cards, so that only row (or column) positions of a given pair of cards determines the exact position of each card of that pair.

Given a deck of n cards, deal some cards into a face-down pile on the table, so that their order gets reversed. If we riffle-shuffle the two piles, then for each k, the top k cards are consecutive in $1, 2, 3, \ldots, n$. This is known as *Gilbreath Principle*.

♠ Does shuffling always destroys the order? (NO!)

♡ Is 142857 the only number with such property? (NO!)

♣ We saw that cards are not only for gamblers but also for mathematicians. Can we do serious research using the mathematical principles stated in these slides? (YES!)

♢ If magic is something that we can't comprehend but can still appreciate, just like these card tricks, then isn't mathematics itself magical?

> If you wish to know more, feel free to contact us at
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