Shuffling a set
The full permutation

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The *k*-element permutation

- We have seen the *k*-element permutation
  - on some *n*-set *S*
  - choose *k* distinct elements from *S*
    - without replacement
  - record them in order
- What do we mean by a permutation on *S*?

Permutations of a set

- A permutation on *S*
  - you permute (order) the entire set
  - it is an *n*-permutation on an *n*-set

When you shuffle a deck of cards, you make a random permutation.

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Counting permutations

How many distinct permutations exist on an n-set?

- The number of k-permutations is $\frac{n!}{(n-k)!}$
- Insert $n = k$ to get $\frac{n!}{(n-n)!}$
- Denominator 0!.
- Convention: $0! = 1$ (empty product)
- Thus we get $n!$ distinct permutations.