



## Not my cup of tea - solution

Pardeep likes her tea with just milk.

Barbara likes her tea with milk and one sugar.

Chris likes his tea with milk and two sugars.

Nabeil likes his tea with milk and a sweetener.



On one occasion someone makes the four people their tea but gets the cups mixed up.

What is the probability that no one gets the correct cup of tea?

### Solving by listing outcomes

Pardeep	Barbara	Chris	Nabeil
B	P	N	C
B	C	N	P
B	N	P	C
C	P	N	B
C	N	P	B
C	N	B	P
N	P	B	C
N	C	P	B
N	C	B	P

There are nine ways of everyone getting the wrong cup of tea.

There are  $4 \times 3 \times 2 \times 1 = 24$  possible ways of arranging the cups of tea.

The probability of everyone getting the wrong cup of tea is therefore  $\frac{9}{24}$

You could also solve this by:

- listing all the ways people could get 1, 2, 3 and 4 right cups of tea and subtracting from 1
- simplifying the problem and considering 2 people, then 3 people before 4 people