1 Lesson 2 Example 1

Each year, as part of a "Secret Santa" tradition, a group of 4 friends write their names on slips of papers and place the slips into a hat. Each member of the group draws a name at random from the hat and must by a gift for that person. Of course, it is possible that they draw their own name, in which case they buy a gift for themselves. What is the probability that everyone in the group ends up buying a gift for themselves? (Note that the names are not placed back in the hat once they are drawn, so each person receives exactly one gift.)

2 Answer

First, calculate the total number of possible outcomes:

$$4! = 4 \times 3 \times 2 \times 1 = 24$$

Since there is only one favorable outcome where each person draws their own name, the probability is:

$$P(\text{everyone draws their own name}) = \frac{1}{4!} = \frac{1}{24}$$

or approximately 0.0417, which is 4.17%.