

MATHCOUNTS[®] Problem of the Week Archive

Gift Exchange – December 25, 2023

Problems & Solutions

Sam, Pam, Ken and Jen are exchanging gifts for the holiday. Each name is written on a slip of paper and placed in a bowl. Sam is the first to randomly select a name from the bowl. What is the probability that Sam selects his own name? Express your answer as a common fraction.

Since only one of the four slips of paper has Sam's name on it, the probability that he will select his own name is $\frac{1}{4}$.

Sam randomly selects Pam's name from the bowl. Pam is the next person to randomly select a name from the bowl. What is the probability that Pam will randomly select Sam's name? Express your answer as a common fraction.

Once Sam selects Pam's name, there are three names remaining in the bowl. Since Sam's name is written on one of the remaining three slips of paper, the probability that Pam will select Sam's name is $\frac{1}{3}$.

How many different gift exchange pairings are there among Sam, Pam, Ken and Jen in which each person randomly selects a name other than their own name?

We can determine the answer by making an organized list. Suppose the friends select a name from the bowl in this order: Sam (S), Pam (P), Ken (K) and Jen (J). The different ordered selections in which each person selects a name other than his/her own name are: P-S-J-K; P-K-J-S; P-J-S-K; J-K-P-S; J-K-S-P; J-S-P-K; K-S-J-P; K-J-P-S; K-J-S-P. These selections yield a total of 9 sets of gift exchange pairings in which each person selects a name other than his/her own.

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Sam randomly selects Pam's name from the bowl. Pam is the next person to randomly select a name from the bowl. What is the probability that Pam will randomly select Sam's name? Express your answer as a common fraction.

How many different gift exchange pairings are there among Sam, Pam, Ken and Jen in which each person randomly selects a name other than their own name?