

Free essay on guess your card 4 players problem

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Let us solve the problem step by step. We will look into each step and analyze the " thoughts" of every player involved

So, after the cards were drawn and placed the situation is as follows (reordered for clarity and easiness of understanding):

Andy: 1, 5, 7

Belle: 4, 5, 7

Carol: 2, 4, 6

Me: 1, 2, 3, 4, 5, 6, 7, 8, 9 (everything is possible at this stage).

First Step

Now Andy draws the question card which considers the sums of the cards.

Let us calculate the sums quickly: Andy has $1+5+7 = 13$, Belle has $4+5+7 = 16$, Carol has $2+4+6 = 12$. Obviously, my sum is unknown (to me). However, as Andy answers " YES" to the question we know that " two (2) or more players whose cards sum to the same value". Obviously, I am one of those players and my sum is 13, 16 or 12. Wait! It cannot be 13, as Andy DOES NOT know his numbers and their sum. Thus, my sum is either 12 or 16.

Let us proceed to the next step.

Second Step

Belle is asked about the number of odd numbers she sees. The answer is " All of them". Andy has 1, 5, 7 and Carol does not have any odd number. So, I must have 3 and 9 - otherwise Belle could not see them. With my sum equal to either 12 or 16, the last number is either 0 (which is not a valid number in this game) or 4.

So actually, I had to speak before Andy and win the game But I did not,

which gives Andy the opportunity to win by easily understanding that since Carol has no odd numbers and I have only 3 and 9 while Belle sees them all (1, 3, 5, 7, 9) - he must have the rest of odd numbers on top of his head, which are 1, 5, 7.

Other Notable things

It is important to note that Andy actually did not use the first question to solve the problem. He can solve it via the second question only, while I can only solve it using both questions.

Carol knows almost nothing regarding her cards (she can, however, understand from Andy's words that she does not have neither 1 nor 5 nor 7 - otherwise Andy could not solve the problem).

Belle knows that her card sum is either 12 or 16 (according to Andy's words). The second question does not provide much information to Belle, as other players "think" disregarding her numbers as player's answer does not shade any light on his cards, only on cards of other players.