

STEP II, 2021, Q12 EC

Question 12

Many candidates were able to reach the required probability in the first part of this question, although many ignored drawn matches instead making an argument that the probability can be found by dividing the probability that A wins this game by the probability that someone wins on this game. While this argument is possible, generally far more justification was needed than candidates provided. Those who identified the necessary sequences were able to successfully reach the result in a well-justified way.

In part (ii) a small number of candidates assumed that the number of games in a match would always be even rather than showing why this must be true. Of the other candidates, many were able to explain why this is the case. Relatively few candidates failed to spot that the games in parts (ii) and (iii) could be reduced to the same game as in (i). In (ii), many candidates attempted a combinatorial argument, but a significant number failed to observe that there are two ways to order each pair where each of the players wins one of the games.

In part (iii) most candidates were able to derive the probability of winning the bold game. Most of those who reached the end of this part used logical implications in the wrong direction, for example showing that if the player is more likely to win the cautious version, then the given inequality holds.



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