MATHCOUNTS® Problem of the Week Archive

College Football Championship – February 28, 2022

Problems & Solutions

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Data science is a critically important field, and there are many interesting careers in data science and analytics!

The great news for Mathletes is that the math you do in MATHCOUNTS—such as statistics, problem-solving, pattern recognition and probability—will prepare you to succeed in our data-driven world. Flex those math muscles with this Problem of the Week covering using data to make predictions!

The College Football Playoff is a four-team single elimination tournament. This year, University of Cincinnati, University of Alabama, University of Michigan and University of Georgia were in the playoffs. Alabama played against Cincinnati and had a 72% chance of winning, and Georgia played against Michigan and had a 67% chance of winning. Based on these percentages, what is the percent chance that Alabama and Georgia would advance to play each other in the championship? Express your answer to the nearest whole number.

*Since Georgia had a 67% chance of winning and Alabama had a 72% chance of winning, the chance they would play each other in the championship was 0.67 × 0.72 = 0.4824, or approximately **48**%.*

Alabama and Georgia played each other in the National Championship in January. The table shows possible average points per possession for each team, as well as possible average number of possessions per game *before* their Championship game. Based on this data, which team would be expected to win the championship game, and by how many points? Express your answer to the nearest whole number.

Category	Alabama	Georgia
Points per possession	2.73	2.56
Possessions per game	14.1	13.4

*If Alabama and Georgia had the points per possession and possessions per game shown in the table, then Alabama would score 2.73 points × 14.1 possessions = 38.493 points, and Georgia would score 2.56 points × 13.4 possessions = 34.304 points. This would mean that **Alabama** would be expected to win by 38.493 – 34.304 = 4.189 ≈ **4** points.*

Some sports analysts predicted Georgia would win the game. Using the data from the previous problem, if there are 30 total possessions between the two teams, what is the least number of possessions Georgia would need in order to win the championship game by 1 point or more? Express your answer to the nearest whole number.

Let's set up a system of equations using the variable A for the number of Alabama possessions and the variable G for the number of Georgia possessions. The total number of possessions in the game will be A + G = 30. Based on the table in the previous problem, for Georgia to win by 1 point or more, then 2.56G – 2.73A ≥ 1. Solving for A in the first equation gives us A = 30 – G. Plugging this into the second equation yields 2.56G – 2.73(30 – G) ≥ 1 → 5.29G – 81.9 ≥ 1 → 5.29G ≥ 82.9 → G ≥ 15.67. So, Georgia would need at least ***16*** *possessions to win.*

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