

Classroom to Campus: Math and Stats Challenge

Grade 11 – MBF3C

Topic D: Data Management

Calculating Probabilities and Expected Outcomes in Dice Rolls

A board game involves rolling two number cubes (dice). The game requires you to roll specific sums to move ahead, and the first player to reach the end wins.

You're focused on calculating the probability of rolling a sum of 7 (which is a winning roll) and the expected number of times it will appear during several rounds of the game.

- Determine the theoretical probability of rolling a sum of 7 with two number cubes. List all the possible combinations that result in a sum of 7. *(Provide your final answer as a percent rounded to two decimal places.)*
- If you roll the two number cubes 1000 times, what is the expected number of times you will roll a sum of 7? *(Provide your final answer as an Integer.)*
- Determine the theoretical probability of rolling a sum that is less than 5 with two number cubes. *(Provide your final answer as a percent rounded to two decimal places.)*
- Determine the theoretical probability of rolling a sum greater than 10 with two number cubes? *(Provide your final answer as a percent rounded to two decimal places.)*
- If you roll the two number cubes twice in a row, what is the probability that the sum of the first roll will be less than 5 and the sum of the second roll will be greater than 10? *(Provide your final answer as a percent rounded to two decimal places.)*
- If you roll the two number cubes twice in a row, what is the probability that at least one of the two rolls has a sum less than 5 or greater than 10? *(Provide your final answer as a percent rounded to two decimal)*

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