Time limit: 15 minutes.
Instructions: This tiebreaker contains 3 short answer questions. All answers must be expressed in simplest form unless specified otherwise. You will submit answers to the problem as you solve them, and may solve problems in any order. You will not be informed whether your answer is correct until the end of the tiebreaker. You may submit multiple times for any of the problems, but **only the last submission for a given problem will be graded**. The participant who correctly answers the most problems wins the tiebreaker, with ties broken by the time of the last correct submission.
No calculators.

1. Every face of a cube is colored one of 3 colors at random. What is the expected number of edges that lie along two faces of different colors?

2. 6 people stand in a circle with water guns. Each person randomly selects another person to shoot. What is the probability that no pair of people shoots at each other?

3. Alice and Bob are playing rock paper scissors. Alice however is cheating, so in each round, she has a $\frac{3}{5}$ chance of winning, $\frac{2}{5}$ chance of drawing, and $\frac{2}{5}$ chance of losing. The first person to win 5 more rounds than the other person wins the match. What is the probability Alice wins?