RAMC 2022
Elementary I Team Round

- **SCORING:** The first 5 questions are worth 2 points each, and last 5 questions are worth 3 points each.

- This round contains 10 questions to be solved in 25 minutes. Problems towards the end tend to be more difficult than problems toward the beginning.

- No computational aids are permitted other than scratch paper, graph paper, and a pen/pencil. No calculators of any kind are allowed.

- All answers must be in a reasonably simplified form.

- Fill out your information, and sign/initial the honor code on the answer sheet provided.

- If you believe there is an error on the test, submit a challenge to the proctors. Please include your name, level (Elem I/II, MS, HS), and explanation of the problem and your solution.

Do not flip the page until the proctor begins the round!

1. Hans goes on a workout. He runs for 20 minutes from his house directly to the park. At the park, he finds a bike, and rides directly back home in 5 minutes. The distance from his house to the park is 2 miles. What is his average speed for his workout, in miles per hour? Express your answer as a decimal.

2. Nick has a 483 jellybeans. He buys 87 more, then eats 12 of them and gives away 293 to his friends. How many jellybeans are left?

3. The CEO of a swim club must choose 3 members to fill some leadership roles. He is looking for a team of 3, with one president, one vice-president, and one captain. How many ways can he assemble this team, if there are 7 members in the club?

4. Jerry adds up the first 100 positive integers and asks his friends if the result is even or odd. Sarah says the result is even, Tom says the result is odd, Mary says the result is divisible by 5, and Jane says the result is divisible by 101. The following statements may be true or false.

    A. Sarah is correct.

    B. Joe is correct.

    C. Mary is correct.

    D. Jane is correct.

    Which of the choices below are accurate? Answer as a number.

    1. A is true; B, C, D are false   2. B is true; A, C, D are false   3. B, C are false; A, D are true
    4. A, C, D are true; B is false   5. B, C, D are true; A is false

5. Jim and Joe both start jogging from the same point. Jim jogs 8 miles east, 1 mile west, and 4 miles south. Joe jogs 6 miles south, 2 miles north, and 7 miles west. What is the final distance between Jim and Joe?

6. Eva and John are driving towards each other on a straight road. They start 46 miles apart. Eva is going 10 mph and John is going 13 mph. If $2A$ represents the amount of time it take for them to meet up, what is A?

7. A rectangular prism has a length of 5 inches, a width of 3, and a height of 6. What is the surface area of the rectangular prism?

8. Poly has to perform at 4 concerts in London this week, but there are not enough seats. Poly doesn't want to let her fans down so she decides to put on another concert. To put on a fifth concert, Poly needs to figure out how many seats she needs. All of the concerts had enough seats to hold 500 people. The first concert had 637, the second had 548, the third had 724 and the fourth had 517. How many seats does Poly need to put on the fifth concert?

9. A local school is forming a math team. The team has 3 spots, and there are 6 different people who want to join. How many ways can they make a team?

10. Jack has two cubes of side length 3, and a rectangular prism with length 6, height 3, and width 3, made of two cubes put together. What is the maximum surface area of a shape he can create with these 3 objects?