RAMC 2022
Elementary I Tiebreaker Round

- **SCORING:** The questions in this round are used to break ties, and do not count towards overall scores.

- This round contains 10 questions. 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. Kevin is filling up a pool. The pool is 20 feet long, 10 feet wide, and and varies in depth. Inside the pool, there's a shallow zone 10 feet long, 10 feet wide, and 5 feet deep. The remaining part has a depth of 7 feet. How many cubic feet of water does Kevin need to fill up the pool.

2. Bob is sharing a pizza with his friends. He takes one third of the pizza, and gives the remainder to Claire. She takes a third of it, and gives the remaining part to Jenny, who eats half of it. What part of the original pizza does Jenny have left?

3. John has a bag of 10 coins. Six are quarters, two are dimes, one is a nickel, and one is a penny. Find the probability that John draws a dime.

4. Ben uses the digits 0, 1, 3, 5, 7, and 9 to create two 3 digit numbers. What is the greatest possible difference between the two numbers, if no digit can be used more than once?

5. If Kelly bought a shirt for 12 dollars when the shirt was 25% off, what was the original price of the shirt?

6. Forrest indulges in a box of chocolates for 5 days. The box includes 20 Cocoa Truffles, 20 Chocolate Caramels, and 10 Dark Chocolate pieces. Each day, he eats either 3 Cocoa Truffles, 2 Chocolate Caramels, or 1 Dark Chocolate piece. At the end of the 5 days, he gives the remaining 36 pieces to a friend. When Forrest receives the box, there are t Cocoa Truffles, c Chocolate Caramels, and d dark chocolates left. Find $tc + d$.

7. A 3 by 3 cube is made of twenty-seven $1 \times 1 \times 1$ cm cubes. If all 4 of the corner cubes are removed, what is the surface area of the cube?

8. The lines $x^2 + 9 = y$ and $y - 2x = 17$ intersect at two points. Let the intersection point in the 2nd quadrant be $(-a, b)$. Find $a + b$.

9. A 40-liter paint mixture is made, with 30% being red, 15% being yellow, the remaining is blue. What percent of the mixture is red paint, if 10 liters of red paint are added to the mix.

10. In a math contest, each student is required to answer 20 problems. For every question answered correctly, the student gets 2 points. If the student answers incorrectly, then the student loses 1 point. Jack answered all 20 questions and earned a score of 22 points. How many questions did Jack get correct?