



RAMC 2024

Elementary I Individual Round

- **SCORING:** The first 10 questions are worth 1 point each, and the last 5 questions are worth 2 points each, for a total of 20 possible points.
- This round contains 15 questions to be solved in 45 minutes. All answers are integers.
- No computational aids are permitted other than scratch paper, graph paper, and a pen/pencil. No calculators of any kind are allowed.
- 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 (E1/E2/MS/HS), and your solution to the problem with explanation.

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

- Find the value of $9 + 6 \times 2 - 5$.
- Bobby bakes 2 pies and gives Lily 1 pie. He cuts the remaining pie into equal eighths, then gives Sally one-fourth of this pie. How many slices is Bobby left with?
- The table below shows the number of muffins (\circ) that Alice, Joy, Kelly, Nicole, and Franklin baked, and the number of chocolate chips (Δ) they each used per muffin.

	Alice	Franklin	Joy	Kelly	Nicole
Number of Muffins baked	$\circ \circ \circ$	\circ	$\circ \circ \circ \circ \circ$	$\circ \circ$	$\circ \circ \circ \circ \circ \circ \circ \circ$
Number of Chocolate Chips per Muffin	$\Delta \Delta$		$\Delta \Delta \Delta \Delta$	Δ	$\Delta \Delta$

How many chocolate chips did they use in total?

- A factory produces 240 bicycles in 8 days. If the factory continues to operate at this rate, how many bicycles will it produce in 15 days?
- Alpha, Beta, and Sigma are sharing a pizza. First, Alpha eats $\frac{1}{3}$ of the pizza, and then Beta eats $\frac{3}{5}$ of what remains. Finally, Sigma finishes the rest. If the pizza is 150 calories (evenly spread throughout), how many calories did Sigma consume?
- The local department store sells 2 types of toilets: white and golden. White toilets cost \$100 each, while golden toilets cost five times as much. If William wants to buy one normal toilet and two golden toilets, how many dollars will he have to pay?
- The length of a certain rectangle is twice its width. Find the perimeter of the rectangle if its width is 3 units.
- I am thinking of an even two-digit number. If its digits sum to 16, what is my number?

9. Alex has written down a five-digit number. He then covers up each digit in his number with either a letter or a number, as shown below.



Alex tells us the following about his number:

1. Every even digit is covered by a vowel.
2. Every consonant covers an odd digit.
3. The last digit is greater than the number it is covered by.
4. There is not a 7 in my number.
5. No two digits in my number are the same.

What is the largest possible number that Alex could have written down?

10. My favorite cake recipe calls for 4 cups of flour and 6 eggs. If I have 3 eggs, how many cups of flour do I have to use to keep the same ratio of ingredients for my cake?
11. Ben is trying to catch a train to Cedar Waterfalls from Rochester. The current train departure schedule at the Rochester Railway Station is shown below, listed in order of departure.

Departure	Destination
in 5 minutes	New Rochester
in 24 minutes	Prague
in 51 minutes	Giantapolis
3:40 PM	Cedar Waterfalls
4:39 PM	Prague
5:03 PM	San Franmayo
5:05 PM	Duleeth

Ben knows that the trains to Prague depart exactly two hours apart. In how many minutes is the next train to Cedar Waterfalls?

12. John challenges his little brother Jim to a bike race. To give Jim an advantage, John lets Jim have a 5-second head start. Jim bikes at 8 meters per second, and John bikes at 10 meters per second. How many seconds will John have to bike in order to catch up to Jim?

13. Eric uses the digits 1 to 9 exactly once to fill in the grid below, such that the sum of digits in each row, column, and main diagonals add up to 15.

	9	
3		
X		6

What digit must be placed in the square labeled X ?

14. Elizabeth is visiting Jerry's CHIKN truck. Jerry sells CHIKN either in a plate of 6 tenders or in a plate of 7 tenders. What is the largest number of CHIKN tenders that Elizabeth can't order exactly?
15. Five years ago, Amy's age was thrice the sum of Bella and Cooper's ages. Three years ago, Amy's age was double the sum of Bella and Cooper's ages. How many years from now will Amy's age be exactly the sum of Bella and Cooper's ages?