0 Practice Round

0.1 Problem 1

I have 3 apples and 5 bananas. Let the total number of fruits I have be L. What is L?

0.2 Problem 2

I have \$$L$ in my pocket (where L is the answer from Question 1). I go to the store and buy 3 KitKats. I now have \$2 left. Let M be the cost of a single KitKat. What is M?

0.3 Problem 3

The sum of $M \times 5$ consecutive numbers is 35 (where $M \times 5$ is the answer to Question 2 multiplied by 5). Let N be the sum of the largest and smallest of these numbers. What is N?

1 Round 1

1.1 Problem 1

A teacher selects 3 students from 5 boys and 4 girls to form a Team Math Attack team. The team must have at least one boy and one girl. There are A distinct ways to form the team. What is A?

1.2 Problem 2

A pair of shoes are being sold for \$$A$ (where A is the answer to Question 1). The store decides to offer these shoes for 10% off. After the discount, the store also makes 50% profit on the buying price. Let the buying price be \$$B$. What is B?

1.3 Problem 3

A 10 m × 10 m flat square roof receives $B \div 10$ mm of rainfall (where $B \div 10$ is the answer to Question 2 divided by 10). All of this water (and no other water) drains into an empty container in the shape of a cube with side lengths of 1.0 m. After all the rain has entered the container, it is C% full. What is C?

2 Round 2

2.1 Problem 1

Marie and Bob live in separate towns, and are both driving to their parents' house for dinner. Marie has to travel 250 km and Bob has to travel 300 km. Bob is going 15 km/h faster than Marie. Marie and Bob both leave their houses at the same time, both travel at a constant speed, and both reach their destination at the same time. Let D be the units digit of Marie's speed. What is D?

2.2 Problem 2

The mathematical mean is the sum of all numbers in a sequence divided by the number of terms in that sequence. The mode is the most common value. Below is a sequence of natural numbers:

$$\{4, 2, 9, 5, 8, 6, 7, X, Y, Z\}$$

Let E be the product of X, Y, and Z, such that both the mean and mode of this sequence is D (where D is the answer to Question 1). What is E?

2.3 Problem 3

Steven makes a grid. Column 1 has the first E positive even numbers written out (where E is the answer to Question 2). Each row is then filled with the multiples of the first number in that row, as demonstrated below:

2	4	6	8	10	...
4	8	12	16	20	...
6	12	18	24	30	...
8	16	24	32	40	...
10	20	30	40	50	...
...	...	...	...	...	...

Let F be the sum of all numbers in the 62nd column. What is F?

3 Round 3

3.1 Problem 1

Let $f(f(3)) = 31$, $f(f(4)) = 40$, and $f(f(5)) = 49$ for some linear function $f(x)$. Let G equal $-f(-0.5)$. What is G?

3.2 Problem 2

Ling writes down $G \times 10$ consecutive whole numbers (where $G \times 10$ is the answer to Question 1 multiplied by 10). She adds the squares of these numbers together and gets 23815 as the sum.

Let H be the sum of the largest and smallest of these numbers. What is H?

3.3 Problem 3

An arithmetic sequence is a set of numbers $\{a_1, a_2 \ldots a_{n-1}, a_n\}$ such that $a_i = a_{i-1} + t$ for some number t whenever $i \geq 2$. For example:

$$\{1, 3, 5, 7, 9\}$$

A certain arithmetic sequence has the property $a_{20} + a_{21} = a_{2021} = H$ (where H is the answer to Question 3).

Let $I = a_1$. What is I if a_1 is a fraction written in lowest terms?