
If there is a problem you can't solve, then there is an easier problem you can solve: find it.

– George Polya

NYU Middle School A

To join the Middle School Circle A there are no requirements except for curiosity and enthusiasm.

We will tackle and introduce ideas of parity, counting, geometry, logic, and combinatorics.

Sample Problems:

0. A man was looking at a portrait when someone asked: “Whose picture is it?” The man replied: “Brothers and sisters I have none, but this man’s father was my father’s son.” Whose portrait was this?
1. Zihan bought a notebook with 96 pages and numbered them from 1 to 192. Amy tore out 25 pages from Zihan’s notebook and added numbers she found on all sides of all pages. Could Amy have gotten 1990 as the sum?
2. We form a six-digit number by repeating a three-digit number, for example 678,678. What is the largest integer that divides all such numbers?
3. Find the value of digit A if the five digit number $12A3B$ is divisible by both 4 and 9 and $A \neq B$.
4. A palindrome is a number that reads the same forwards and backwards. For example 1, 11, and 141 are all palindromes. How many palindromes between 1 and 1000 are divisible by 11?
5. To a two-digit number you attach to its right the same number, forming a four-digit number, e.g. 2424. How many times larger is the new number than the original number?
6. Determine the largest positive integer n such that $1005!$ is divisible by 10^n .
7. If p is a prime number greater or equal to 5, then find the largest integer that divides $p^2 - 1$ without a remainder.

Problems compiled by Eliza Kuberska