

# CHSMO November Mini

## C.H.M.C

### Rules and Regulations

1. Contestants are not allowed to communicate with any other person during the contest.
2. Using a calculator is strictly prohibited.
3. Using AI or other tools and digital software is also strictly prohibited.
4. Do the contests fairly, cheating is strictly prohibited.

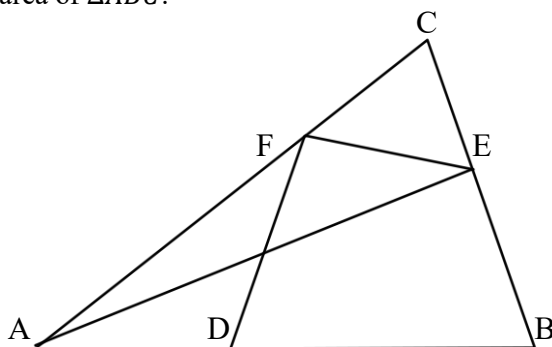
### PART A

1. What is the smallest value of  $n$ , which is greater than 2025, such that when

$$2026^1 + 2026^2 + \dots + 2026^x$$

Is divided by 5, the remainder is 3?

2. Let there be real numbers  $x, y$ , such that  $|x| + x + 5y = 2$  and  $|y| - y + x = 7$ . Hence find the value of  $x + y$
3. The area of the triangle  $\triangle ABC$  is 50 units squared. Let  $AD = 3$ , and let  $DB = 6$ , with the area of  $\triangle AFB$  is equal to the area of  $\triangle BCF$ , and the area of  $\triangle AFD$  is equal to the area of  $\triangle FDE$ . Hence find the area of  $\triangle ABC$ .



4. Let  $S$ , be defined as the following

$$S = \left\{ \frac{1}{2025}, \frac{2}{2025}, \frac{3}{2025}, \dots, \frac{2025}{2025} \right\}$$

A fraction is called *CHMC*, if it can be reduced, for example  $\frac{2025}{2025}$  can be reduced to 1, and  $\frac{3}{2025}$  can be reduced to  $\frac{1}{675}$ . Hence if the positive difference between the *non-CHMC* fractions and *CHMC* fraction can be expressed as  $\frac{m}{n}$ , find  $m + n$ .