



## THE 2022 YOUNG MATHEMATICAL STORY AUTHOR (YMSA) COMPETITION

THE STUART J. MURPHY AWARD  
(THE 8-11 YEARS OLD CATEGORY)

### LONGLISTED

‘Young Sherlock Holmes and the Sub-zero Mystery’ by Petros Pieroua  
(11 years old) at the International School of Paphos (Cyprus)

You can read the author’s inspiration for the story and the judges’ comments  
on:

[www.mathsthroughstories.org/ymsa2022](http://www.mathsthroughstories.org/ymsa2022)

#YMSAMaths

YOUNG SHERLOCK HOLMES AND  
THE SUB – ZERO MYSTERY



**PETROS PIEROUA**

THE INTERNATIONAL SCHOOL OF PAPHOS

## THE SUB-ZERO MYSTERY

Our story begins in the city of London, population 8.9 million, where a peculiar young man called Sherlock Holmes Junior lived. That is right, the son of the great detective Sherlock Holmes. Our hero is currently living in a small apartment at 31 Angle Avenue, with his best friend John Watson.

While the two roommates were enjoying a cup of Earl Grey tea along with some television, the news started. "News Headlines No.1: An innocent lady called Mary Smith has been killed in her home in an unknown way. The victim was found at 7 am in the morning and no wounds were found on the body."

"Watson, it's time I wrote a letter to my brother Caligula, Chief of the Queen's 5<sup>th</sup> Police Division," Sherlock said.

*Dear brother, I would like to ask a favor. The latest murder of Ms. Smith has attracted my intelligence. My mind finds the murder a puzzle. I know you can put me on the case. Please remove everyone that is investigating this case and let me work on it.*

*Your Brother, Sherlock Holmes*

"Hopefully, he will agree Sherlock," said Watson.

Of course, they received permission from Sherlock's brother, Caligula Holmes. The next morning Sherlock and Watson walked four and half blocks to where the murder transpired. Once they started investigating the scene of crime, they looked everywhere for anything suspicious. There were no blood stains on the floor or various places. After two hours of searching for clues Sherlock and Watson decided to leave and go back to their apartment. The only thing they found was a broken glass vase and the mysterious question was who broke the vase?



A couple of hours later, Sherlock took the vase to the lab. After analyzing it, he tried to take a blood sample of 10 ml from the body of the victim, but the blood seemed to be frozen. When the results of the blood and the analyses of the vase came out, it was clear that Ms. Smith was killed by sub-zero temperatures, exactly  $-24^{\circ}\text{C}$ .

"Watson, the game is afoot! I want you to go and report to my brother that the victim was killed by freezing temperatures while I search the victim's history".

"Ok Sherlock." Watson replied.

"Interesting!" Sherlock said, "It seems that Ms. Smith was the sister of Queen Elizabeth's doctor!"



Ms. Mary Smith . yahoo . com

F u n F a c t +

I am the sister of the Queen's doctor.

Sherlock called his brother to explain the victim's history and the plan to catch the murderer. The plan was easy but needed calculations.

Sherlock knew the victim died at  $-24^{\circ}\text{C}$ . Yet, he thought, Ms. Smith must have experienced hypothermia and begun to lose consciousness at  $21^{\circ}\text{C}$ . As she fell to the floor, she knocked over and broke her glass vase. The difference between the two temperatures was  $45^{\circ}\text{C}$ . What was so important about 45?

"45? 45? Hmmmm..." Sherlock murmured.

"What 45? 45 days?" asked Watson.

"That's it! In 45 days, he will strike on the 6<sup>th</sup> of February 2022, the Queen's 70<sup>th</sup> Jubilee! Elementary my dear Watson!" exclaimed Sherlock.

The plan was set and the Queen's doctor, Mr. Smith, was now under police protection.

$$21 - (-24) =$$

$$45$$





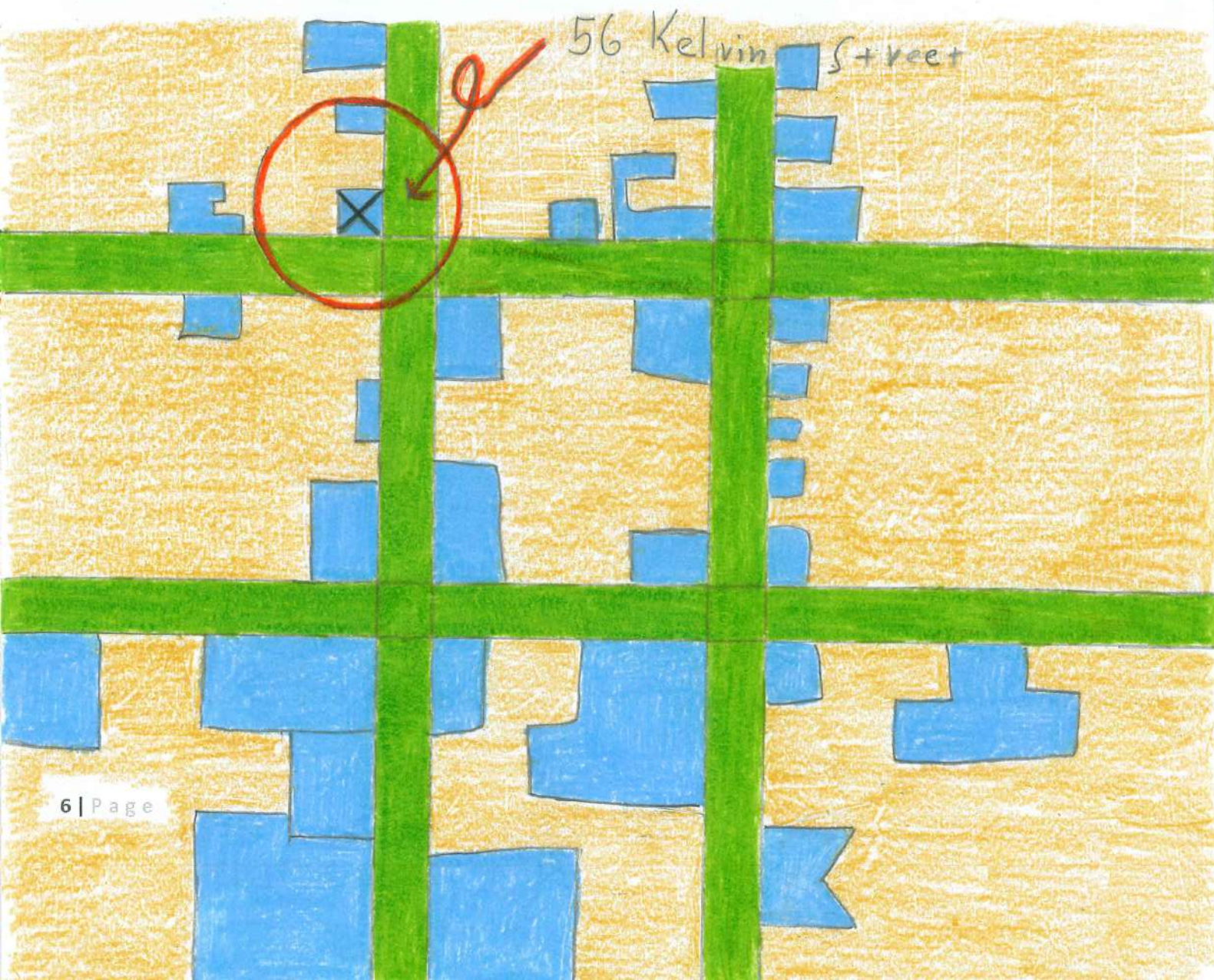
On the day of the Queen's Jubilee, the parade began with huge crowds and the bait was set. The Queen's doctor was in his office with a squad of 25 police officers behind the door.

Suddenly, the window shattered, and the door locked. Loud shouts for help could be heard. When the door opened, 4.5 minutes later, the Dr. Smith was found unconscious with hyperthermia. He was rushed to the hospital. Luckily, the doctor's life was saved within hours, and no one got hurt.

Sherlock did not sleep all night, he kept thinking of clues that would help reveal the location of the murderer. Next morning at 8 am, Sherlock and Watson investigated Ms. Smith's house again.

"Watson! Look at this!" shouted Sherlock.

Sherlock found the digital thermostat of the house. He searched the recent setting of the temperature and found that it was set to  $-24^{\circ}\text{C}$ , down from  $32^{\circ}\text{C}$ . Sherlock stood for a minute and thought, 'What could these numbers mean?' He soon realised the difference was  $56^{\circ}\text{C}$ . Sherlock rang his brother Caligula and told him to race to 56 Kelvin Street because it was the possible location of the hidden murderer.





Looking at a map of Greater London, they set out for the house at 56 Kelvin Street, driving at 120 km/hour. When they arrived, they circled the perimeter of the house and prepared for potential escape of the criminal.

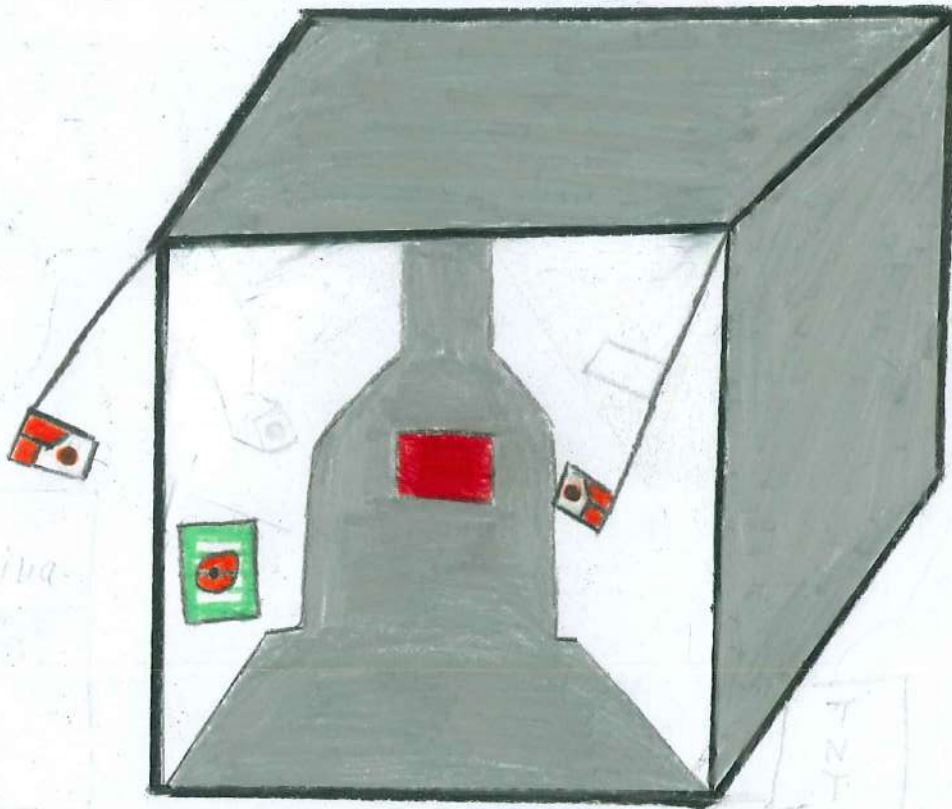
After waiting 45 minutes, Sherlock and Watson led a task force of 56 men inside through the back door. Sherlock heard footsteps going down the basement. He knew that the footsteps belonged to the murderer that was trying to hide. Sherlock ran quickly and locked the basement door.



120/km

Sherlock shouted to the criminal, "Give up! Or perish the same way your victims did!" He turned down the thermostat to  $21^{\circ}\text{C}$ , knowing the murderer would soon lose consciousness. When the criminal realised it was getting colder, he gave up and turned himself over to the police.

The victims were avenged and the murderer (also known as the Denominator) was finally behind bars.



Denominator's Cell

High-tech Cell

Denominator's Cell

**Young Sherlock finds himself investigating a chilling mystery. Will he be able to do the maths, find the murderer and avenge the victims?**