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|  | S5 B Test, June 2023  Teachers : M. A. COSTA MOLINA, A. FIELDING, A. HARSANYI, A. C. LENTI, O. PICAUD, S. ANGELOZI, S. F. SOLANDER, J. SZUTY, L. WURZER. |

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|  | **MathématiCs 4 périodS**  **Part B** |  |

**Date :** 14 June 2023

Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Class : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Score : \_\_\_\_\_ / 20

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| **DurATION OF TEST :**  45 minutes : 10h00 - 10h45  **AUTHORIZED MatériAl :**  Examination with technological tool: Calculator Casio Graph 90+E, Numworks or TI-83 Premium CE Python in exam mode.  Pencil  Ruler  **Remarques particulières :** |  |

* The subject includes 4 compulsory exercises.
* The answers must be accompanied by the explanations necessary for their elaboration.
* Full points cannot be awarded for a correct answer in the absence of the reasoning and explanations that lead to this answer.

Stay calm and focused.

Good job and good luck.

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| **Exercice B1** | **Marks** |
| Medical doctors often use radioactive iodine a tracer when diagnosing some thyroid gland disorders. The iodine decays in such a way after days, the amount left is given by :  where is measured in grams. |  |
| 1) **Calculate** the initial amount of iodine. | 1 point |
| 2) **Calculate** how much iodine remains after 15 days (**round** to two decimals) | 1 point |
| 3) **Calculate** the date when the amount of iodine drops below 1 gram (**round** to 1 day). | 2 points |
| The diagram below shows the elimination of iodine from the body: |  |
| 4) Based on this graph and the expression of the function, **explain** why the iodine is not completely removed from the body. | 1 point |

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| **Exercice B2** | **Marks** |
| An athlete, specialist in the shot put, participates in the eliminatory events with a view to his possible selection for the European championships. He is required to make 12 throws, the lengths of which, in meters, are given below:  18.6, 19.4, 20.8, 15.9, 17.7, 21.1,  19.8, 15.2, 17.2, 16.5, 20.5, 21.9 |  |
| 1) **Find** the mean of the series of throws. **Interpret** this result with a sentence. | 1 point |
| 2) **Find** the median of the series of throws. **Interpret** this result with a sentence. | 1 point |
| 3) **Determine** the quartiles of the series of throws and **draw** the box-plot. | 2 points |
| Another athlete has also made 12 throws, and the box and whiskers plot of those throws, in meters, are given below : |  |
| 4) **Compare** the series of throws of those 2 athletes. | 2 points |

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| **Exercice B3** | | | **Marks** |
|  | | The Louvre pyramid in Paris is a regular square-based pyramid of 21.6m height. The square base measures  35 m each side. The triangular faces are made of glass.  The formula for the volume of a  pyramid is: |  |
| 1) **Calculate** the volume of the space enclosed in the pyramid. | | | 1,5 point |
|  | H is the midpoint of [AB]. | |  |
| 2) In the diagram opposite, **represent** [EH], the height of the triangle ABE from E (by coding the figure), then show that EH = 27.8 m, rounded to tenths of a meter. | | 1 point |
| 3) **Calculate** the area of the glass. | | 1,5 point |
| 4) The Louvre pyramid is a reduction of the Cheops pyramid in Egypt. The base of the Cheops pyramid has a side that measures approximately 230.5 m. Show that the height of the Cheops pyramid is approximately 142.3 m. | | | 1,5 point |

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| **Exercice B4** | **Marks** |
| The balloon in the image is tied to the ground with a 50 meter rope. |  |
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| **Calculate** the distance between the ground and the bottom of the balloon basket. | 3,5 points |

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**END OF THE EXAMINATION**