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.

MATHEMATICS 4 PERIODS

PART B

DATE : 14 June 2023

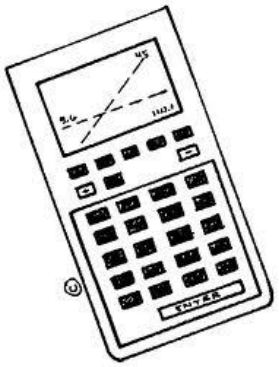
Name : _____

Class : _____

Score : _____ / 20

DURATION OF TEST :

45 minutes : 10h00 - 10h45



AUTHORIZED MATERIAL :

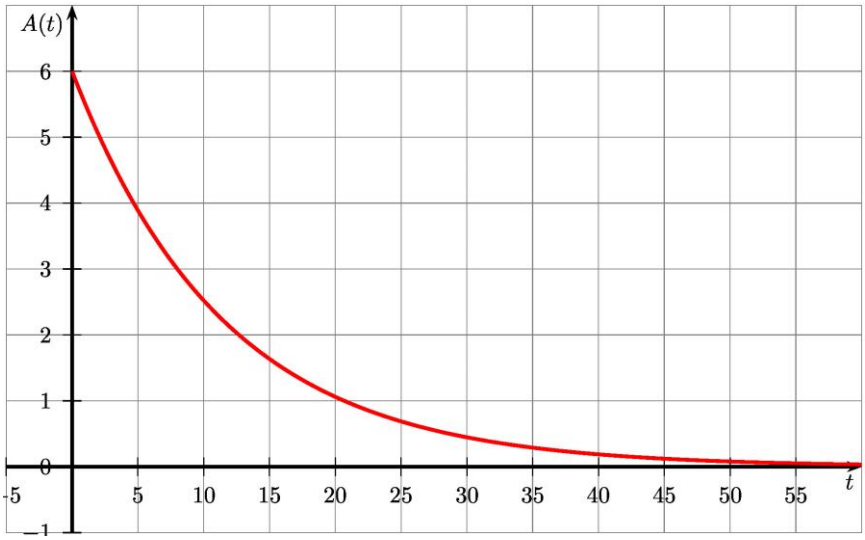
Examination with technological tool: Calculator Casio Graph 90+E, Numworks or TI-83 Premium CE Python in exam mode.
Pencil

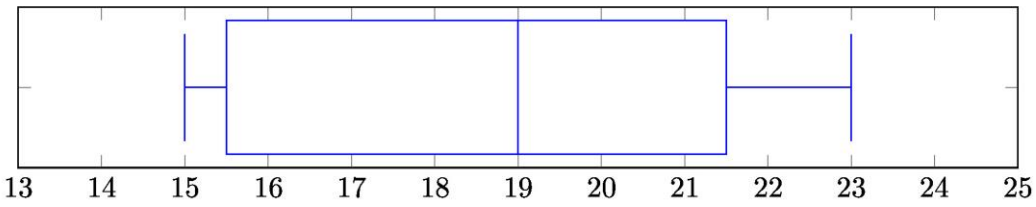
Ruler

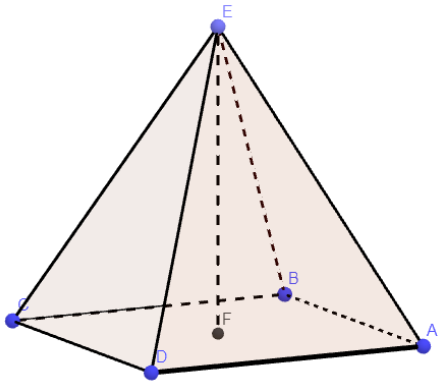
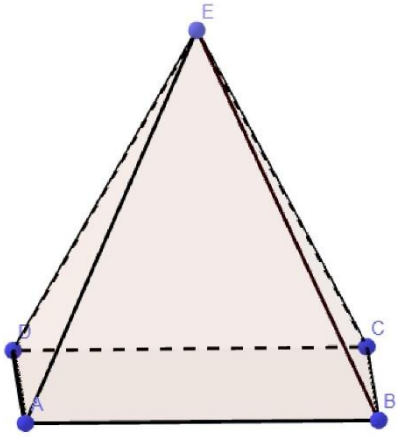
REMARQUES PARTICULIERES :

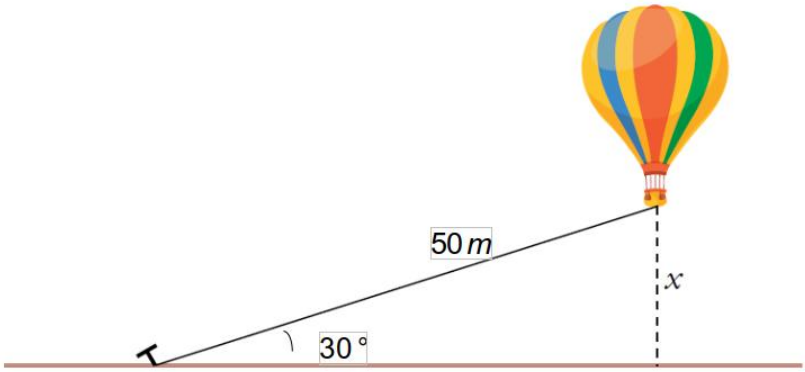
- The subject includes 4 compulsory exercises.
- The answers must be accompanied by the explanations necessary for their elaboration.
- Full points cannot be awarded for a correct answer in the absence of the reasoning and explanations that lead to this answer.

Stay calm and focused.
Good job and good luck.

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 t days, the amount left is given by : $$A(t) = 6 \cdot 0.917^t$$ where $A(t)$ 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). The diagram below shows the elimination of iodine from the body: 	2 points
4) Based on this graph and the expression of the function, **explain** why the iodine is not completely removed from the body.	1 point

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. Another athlete has also made 12 throws, and the box and whiskers plot of those throws, in meters, are given below :  	2 points
4) **Compare** the series of throws of those 2 athletes.	2 points

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: $\frac{1}{3} \times area\ of\ base \times height$	
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

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

END OF THE EXAMINATION