S5 B test, June 2023

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MATHEMATICS 6 PERIODS

PART A

DATE: June 14, 2023

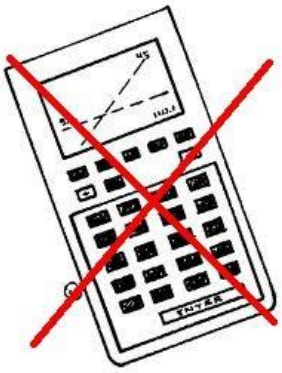
Last name, First name: _____

Class: S5MA6ENA

Marks:__ __ / 19

DURATION OF THE TEST:

45 minutes: 8:30 am - 9:15 am



AUTHORIZED EQUIPMENT:

Exam without technological support

Pencil for Drawings/ graphics

Ruler

SPECIAL NOTES:

- The subject consists of 3 mandatory exercises.
- The answers must be accompanied by the explanations necessary for their preparation.
- All points cannot be attributed to a correct answer in the absence of the reasoning and explanations that make it possible to arrive at this answer.
- The candidate must answer on the subject: empty spaces are left in each exercise to do this.

Stay calm and focused.
Good job and good success.

Exercise A1	**Points**
1. If $a = log\,8 + log\,5 - 2\,log\,\sqrt{4}$ $b = 3^{\frac{1}{2}log_3(2)}$ and $c = \log_3(27)$, **justify** that $a<b<c$. **Present** your reasoning.	3 points
2) **Solve** in the real numbers the following equations: a) $(3^{x-1})^2 = 3^{x-5}$ b) $4^{x-2} = 8^x$	3 points

Exercise A2	**Points**
1) **Solve** the equation $cos(x) = \frac{-1}{2}$, for $x \in R$.	2 points
2) **Solve** the equation $sin\left(x - \frac{\pi}{5}\right) = \frac{-\sqrt{2}}{2}$, for $x \in [0;\ 2\pi\ ]$.	2 points
3) **Solve** the equation $2\,sin^2 x + sin\,x - 1 = 0$ for $x \in [0;\ 2\pi\ ]$.	3 points

Exercise A3 (Page 1/2) | **Points**

A hospital group has two retirement homes named "Mouette" and "Rossignol".

These two houses have 120 residents in total including 80 at the residence " Mouette ".

Caregivers in this hospital group assess residents' ability to dress independently according to a three-level A , B and C grid.

45 residents of the "Mouette" house are assessed at level A; 50% of the residents of the "Rossignol" house are rated at level B;

A total of 20 residents are assessed at level C, half of whom reside at the "Mouette" house.

One of the residents of these houses is randomly selected and the following events are considered:

M: " the person is a resident of the Mouette house";

A: "the person is assessed at level A";

B: "the person is assessed at level B";

C: "the person is assessed at level C".

1) **Complete** the following table : — 1 point

	A	B	C	Total
" Mouette "	45			80
" Rossignol"				
Total			20	120

Exercise A3 (Page 2/2)	**Points**
2) In the following questions, the answer is given by giving the results as a simplified fraction.	
a) **Determine** the probability of event *M* and the probability of event *C*.	1 point
b) **Describe** the $M \cap A$ event with one sentence and **calculate** the probability of this event.	1.5 points
c) **Calculate** the probability that the randomly selected person will reside in the « Mouette » house given that he has been assessed at level A.	1 point
d) **Calculate** the probability $P(\mathbf{C} \mid \mathbf{M}')$. **Interpret** this probability in the context of the exercise.	1.5 points

END OF THE EXAMINATION