



Ref.: 2022-05-D-45-en-2

Original: FR



A digital teaching, learning and assessment tool for mathematics and physics

Approved by the Joint Teaching Committee by means of written procedure – PE 2022-27 on 14th of June 2022.

This decision cancels and replaces, with immediate effect, the previous decision taken by the Joint Teaching Committee on 13 and 14 February 2020 concerning the document entitled "A digital teaching, learning and assessment tool for mathematics and sciences" - ref. : 2020-01-D-76-en-2.

Context

After an implementation period stretching across almost two school years, as stipulated in the document (2021-11-D-45), the expert working group has continued to monitor the situation with regard to the implementation, in the schools, of the chosen technological tool – GeoGebra 6 and Suite. Numerous training courses have been organised and a survey on student confidence in using the tools has also been conducted. In light of the results of this survey, additional measures have been taken. However, due to the pandemic, no assessment of the examination method could be carried out in 2020 or during the first semester of 2021 by means of large-scale mock examinations.

In December 2021, in light of the developments to the GeoGebra app and the situation in the schools, it was decided to:

1. postpone the entry into force of use of the “GeoGebra Suite” app in “exam mode” during the examination session scheduled for the second semester in June 2022 for pupils in classes S5 and S6. This decision will also apply to pupils going into classes S6 and S7 next school year, 2022-2023;
2. take a decision, before the end of the school year 2021-2022, concerning the cohort entering class S5 in en 2022-2023 while taking account of the development of the situation and after a continuous analysis conducted by the expert working group responsible for the choice of technological support.

The expert working group responsible for the choice of technological support pursued its analysis work during the second semester of 2021-2022. During its meeting of 13 May 2022, it noted that the developments to the GeoGebra app and the situation are still not favourable to the implementation of this application for examinations in sufficient conditions of equity and security.

Consequently, the expert working group responsible for the choice of technological support recommends once again amending the decision taken in February 2020 for the new cohort of pupils going into class S5 during the school year 2022-2023.

Furthermore, the WG emphasised that:

- the decision taken in December 2021 is not modified and still applies to the pupils going into classes s6 and s7 next school year, 2022-2023;
- in accordance with the syllabus for years s4 to s7, GeoGebra and other apps must be used in class under conditions that will be stipulated in memorandum 2022-06-M-5

The WG expert responsible for the choice of technological support will pursue its analysis and proposal work taking account of the fact that the present recommendations will apply to the entire cohort and thus for school years 2023-2024 and 2024-2025 for these pupils entering classes s6 and s7.

Recommendations

In accordance with the recent decisions, taken by the Joint Teaching Committee dated 15 December 2021 by written procedure 2021-61, concerning the use of the GeoGebra Suite software “in exam mode” for the second semester examination session in June 2022 for pupils in classes s5 and s6 (memorandum 2021-12-M-1 and document entitled “*A digital teaching, learning and assessment tool for mathematics and physics*”, 2021-11-D-45) and in accordance with the information note resulting from this decision, sent on 2 March 2022 – 2022-02-LD-18, the group of experts responsible for the choice of the technological support, which met remotely on 13 May 2022, recommends:

For mathematics and physics syllabuses for the school year 2022-2023:

- **Level s4: a scientific calculator** with, at least, the sin, cos and tan trigonometric functions.

However, it is left to the discretion of the schools to anticipate the purchase, for level s4, of a model corresponding to the recommendations for level s5.

- **Level s5:**

- **For examinations and classwork:** a graphic scientific **calculator**.

The parameters/technical specifications of this scientific calculator are indicated in appendix 1 of the present document.

- **For classwork only:** use of various **apps** in accordance with the syllabus (programming, spreadsheets, dynamic geometry, data processing, etc.).

No specific device should be purchased by the families for this purpose. A device provided by the school (specific room, trolleys or general equipment), a personal device within the framework of a BYOD scheme already implemented, or a personal smartphone, as for years s1 to s4 may be used. This device may also be used during assessments which contribute to the grade A.

- **Level s6/s7:**

- **For examinations and classwork:** a scientific calculator, **possibly graphic**.

The required parameters/technical specifications of the scientific calculator are indicated in appendix 2 of the present document.

The teachers will take care to draft test and examination questions for which use of a graphic calculator will not provide any advantage.

This recommendation complies with the decision taken by the Teaching Committee on 15 December 2021 and published under the reference 2021-12-M-1, in accordance with information note 2022-02-LD-18.

- **For classwork only:** a **device** making it possible to use GeoGebra and other apps.

This device is the one used during the school year 2021-2022. It may also be used during assessments which contribute to the grade A.

Proposal for classwork only

	22-23	23-24	24-25
S1-S3	Scientific calculator <i>and apps</i>	Scientific calculator <i>and apps</i>	Scientific calculator <i>and apps</i>
S4	Scientific calculator <i>and apps</i>	Scientific calculator <i>and apps</i>	Scientific calculator <i>and apps</i>
S5	Scientific calculator <i>and apps</i>	To be decided in 2022-2023	To be decided in 2023-2024
S6	Scientific calculator <i>and GeoGebra</i>	Scientific calculator <i>and apps</i>	To be decided in 2022-2023
S7	Scientific calculator <i>and GeoGebra</i>	Scientific calculator <i>and GeoGebra</i>	Scientific calculator <i>and apps</i>

Proposal for examinations only

	22-23	23-24	24-25
S1-S3	Scientific calculator	Scientific calculator	Scientific calculator
S4	Scientific calculator	Scientific calculator	Scientific calculator
S5	Graphic calculator	To be decided in 2022-2023	To be decided in 2023-2024
S6	Scientific calculator	Graphic calculator	To be decided in 2022-2023
S7	Scientific calculator	Scientific calculator	Graphic calculator

Decisions

The Joint Teaching Committee approved, with immediate effect, the recommendations issued above by the expert WG responsible for choosing the technological support during its meeting of 13 May 2022 for the school year 2022-2023.

For the new cohort of pupils going into class s5 during the school year 2022-2023, these recommendations involve amending the decisions taken in February 2020 (ref. : 2020-01-D-76 in appendix 4).

Furthermore, the WG emphasised that:

- the decision taken in December 2021 is not modified and still applies to the pupils going into classes s6 and s7 next school year, 2022-2023.
- in accordance with the syllabus for years s4 to s7, GeoGebra and other apps must be used in class under conditions that will be stipulated in memorandum 2022-06-M-5

The WG expert responsible for the choice of technological support will pursue its analysis and proposal work taking account of the fact that the present recommendations will apply to the entire cohort and thus for school years 2023-2024 and 2024-2025 for these pupils entering classes s6 and s7.

The documents impacted by these decisions will be updated accordingly.

Appendix 1

PARAMETERS/TECHNICAL SPECIFICATIONS OF THE CALCULATOR IN S5 2022-2023

EN

Required functionalities:

- Trigonometric functions
- Exponential & logarithm
- Numerical equation(s) solving
- 1-Var & 2-Var statistics
- Factorials & combinations
- Binomial distribution
- Normal distribution
- Functions: table of values
- Numeric integration
- Numerical differentiation
- Graphing

Forbidden functionality:

- Computer Algebra System

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Fonctionnalités requises :

- Fonctions trigonométriques
- Exponentielle et logarithme
- Résolution d'équation(s) numérique(s)
- Statistiques à 1 et 2 variables
- Factorielles et combinaisons
- Distributions binomiales
- Distributions normales
- Fonctions : tableau de valeurs
- Intégration numérique
- Différenciation numérique
- Graphiques

Fonctionnalités interdites :

- Calcul formel

Annexe 2

PARAMETERS/TECHNICAL SPECIFICATIONS OF THE CALCULATOR IN S6/S7 2022-2023

EN

Required functionalities:

- Trigonometric functions
- Exponential & logarithm
- Numerical equation(s) solving
- 1-Var & 2-Var statistics
- Factorials & combinations
- Binomial distribution
- Normal distribution
- Functions: table of values
- Numeric integration
- Numerical differentiation

Allowed functionality:

- Graphing (this part will not be assessed in the European Baccalaureate examinations)

Prohibited functionality:

- Computer Algebra System

FR

Fonctionnalités requises :

- Fonctions trigonométriques
- Exponentielle et logarithme
- Résolution d'équation(s) numérique(s)
- Statistiques à 1 et 2 variables
- Factorielles et combinaisons
- Distributions binomiales
- Distributions normales
- Fonctions : tableau de valeurs
- Intégration numérique
- Différenciation numérique

Fonctionnalité autorisée :

- Graphisme (cette partie ne sera pas évaluée au Bac)

Fonctionnalité interdite :

Calcul formel