The New Marking System

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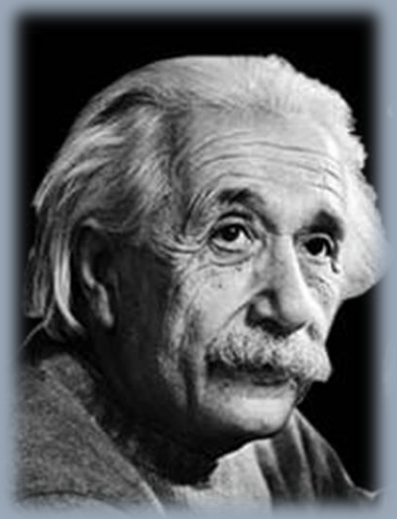
1. About me

- Secondary and higher education math teacher (1974-2017)
- Founding director of the secondary school « Lycée Aline Mayrisch Luxembourg » www.laml.lu (2000-2018)
- Coordinator of initial teacher training at the Luxembourg University Center, focus on “Autonomy and Accountability” (1996-2000)
- Associate Lecturer, Coordinator of mathematics didactic at University of Luxembourg – Faculty of Science, Technology and Communication (2004-2017)
- Currently: Member of the Board of Governors and President of the Scientific Council of the “UP Foundation” for Education

Visit my blog (in 4 languages FR, DE, EN, LUX): www.gastonternes.eu



"Education is not the learning of facts, but the training of the mind to think."

- ALBERT EINSTEIN

https://www.mentimeter.com/app

2. Why these changes?

- Focus on pupil's positive performance and attainment
- Harmonisation and transparency of assessment across the different language sections throughout the European School system (*specific criteria and attainment descriptors*)
- Consideration and awareness of the proportion of questions that assess different competences

What is new?

- The pass mark is set to 5 out of 10 !

- Seven levels of performance

  characterized by a performance descriptor and with specific attainment descriptors (5 positive, 2 negative).

3. How become competent in mathematics?

An example among many others …

2017, 3P

The number of training sessions attended by 13 gym members last month is shown below.

4, 5, 7, 7, 7, 8, 10, 10, 11, 11, 13, 13, 14 .

Determine the median, the lower and upper quartiles.
Hence represent the data on a box plot. — 5 marks

2019, 3P

10 students score the following marks in a test:

10 2 5 7 8 5 6 7 8 4 .

Determine the median, the lower and upper quartiles, and represent the data on a boxplot. — 5 marks

Focus on …

Testimony of a teacher from the European Schools who teaches mathematics in the most demanding higher classes:

*"It's **advanced mathematics** because, instead of having to learn and reproduce mathematics, pupils **have to learn and reproduce a lot** of maths."*

What we know:

Training of identical, familiar questions over the years

is not a vector

of efficient learning.

It's just good memory training!

4. Linking the attainment descriptors with …

the **attainment decriptors** in mathematics are …

e.g.:

Grade A (9.0 - 10 excellent)

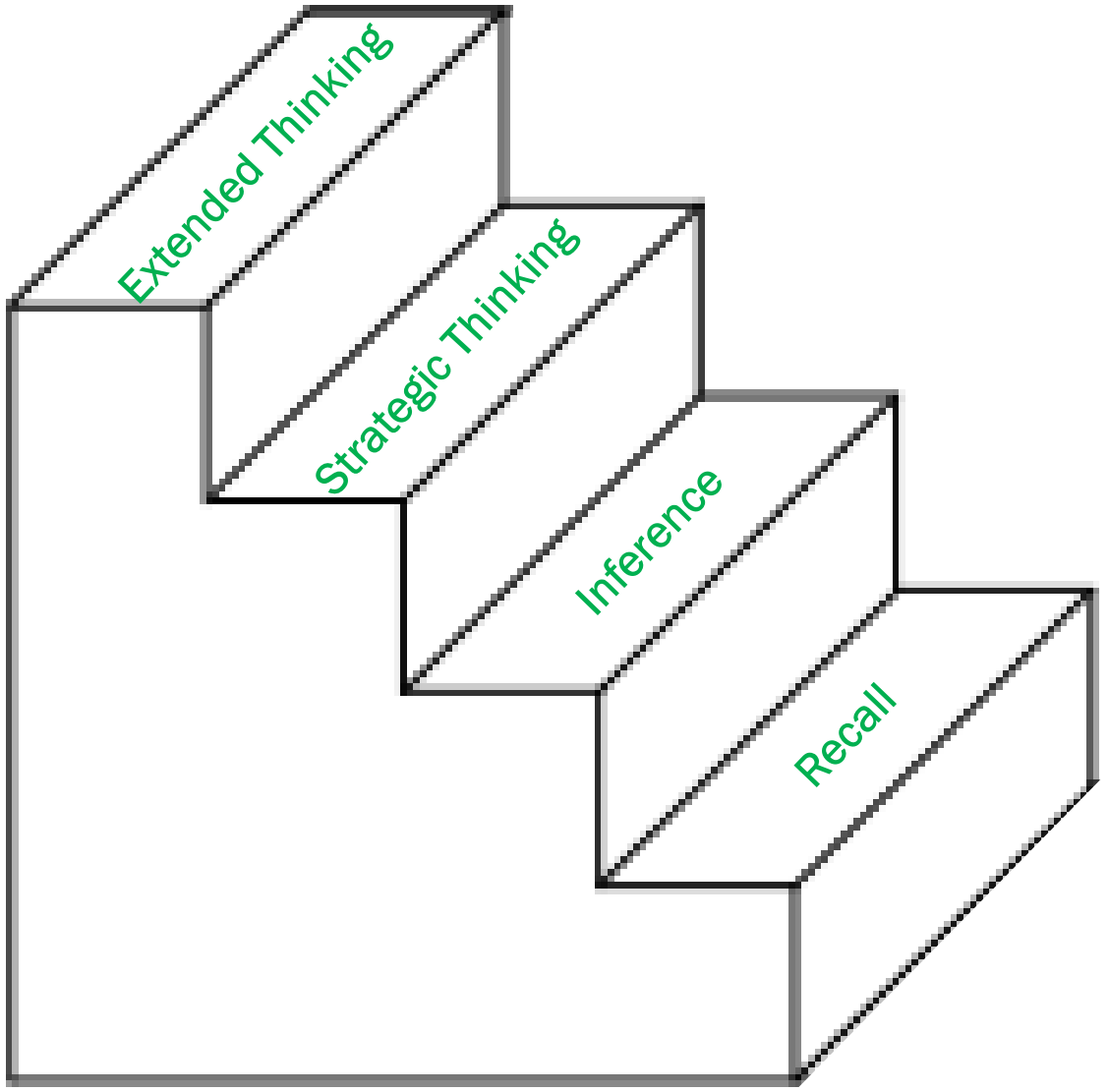
The student demonstrates a comprehensive knowledge of the syllabus, … successfully carries out mathematical processes in all areas of the syllabus, …

…linked to the competences

- Knowledge and Comprehension
- Methods
- Problem Solving
- Interpretation
- Communication
- Digital Competence

Levels of thinking in context

A bridge from the attainment descriptors to the competences



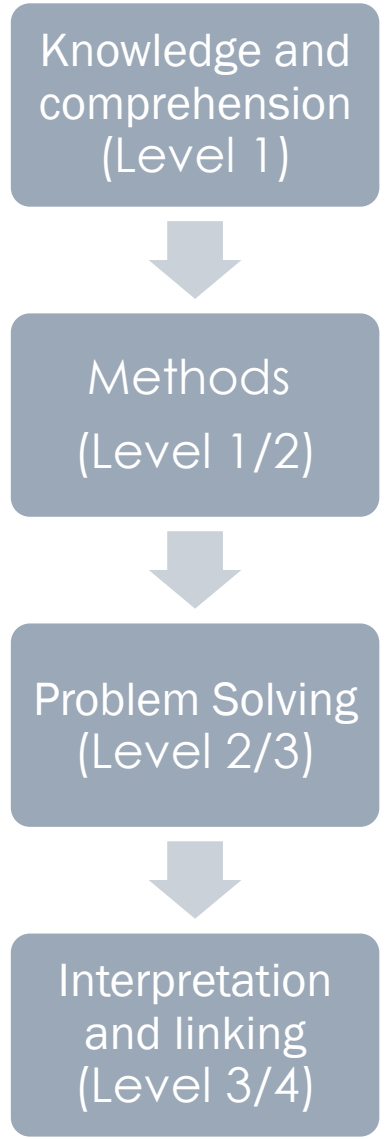
Levels of Thinking in Context

Level 1. *Recall*: Tasks at this level require recall of facts or rote application of simple procedures. The task does not require any cognitive effort beyond remembering the right response or formula.

Level 2. *Inference*: At this level, tasks require some choice of approach and straightforward reasoning in response to a familiar-looking situation or problem. Tasks with more than one mental step are usually level 2.

Level 3. *Strategic Thinking*: At this level of complexity, tasks require planning and abstract thinking. A task with multiple valid approaches or non-routine problems would be level 3.

Level 4. *Extended Thinking*: Tasks at this level require the ability to synthesize or extend knowledge, possibly from different areas of the subject, and to justify the chosen approach, methods and results, in order to solve problems involving unfamiliar concepts or theorems.



What about

Communication

and

Technologies?

They are expected in **all the questions**.

They are **embedded throughout the assessment** and do not need a separate specific mark.

5.

Weighting the competences

Math 3P

Competences	%	Total marks	PART A (without calculator) Guideline marks	PART B (with calculator) Guideline marks
Knowledge and comprehension	30%	30	12	18
Methods	45%	45	18	27
Problem solving	20%	20	8	12
Interpretation and linking	5%	5	2	3

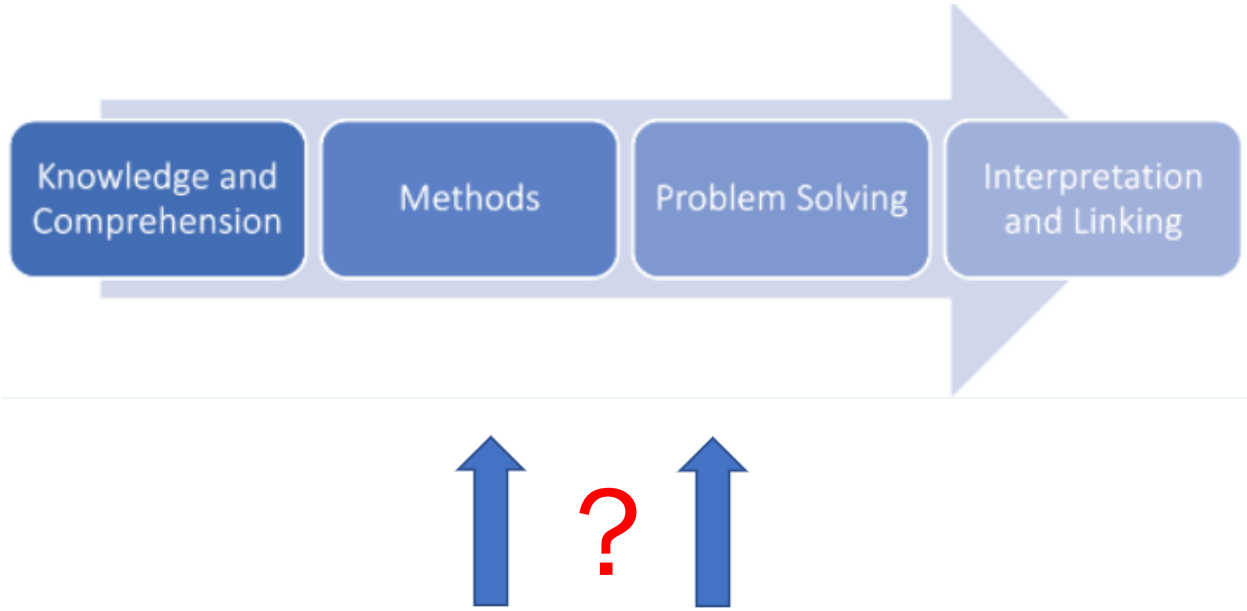
Math 5P

Competences	%	Total marks	PART A (without calculator) Guideline marks	PART B (with calculator) Guideline marks
Knowledge and comprehension	25%	25	7	18
Methods	40%	40	12	28
Problem solving	30%	30	9	21
Interpretation and linking	5%	5	2	3

How could we distribute the marks?

Scale:

Competences in increasing order of difficulty.



A very practical idea

What is the highest level required by a question?

Highest Level of thinking in context:

1 → Knowledge and comprehension

2 → Methods

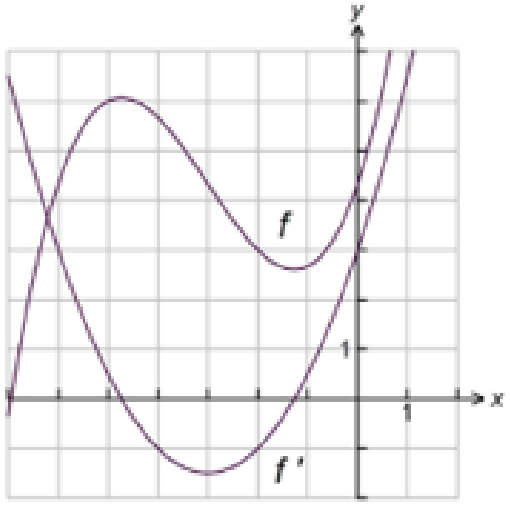
3 → Problem solving

4 → Interpretation and linking

Afterwards: split the marks

6. Let's look at an example

The diagram below shows the graph of a function f and the graph of the derivative f' of f.

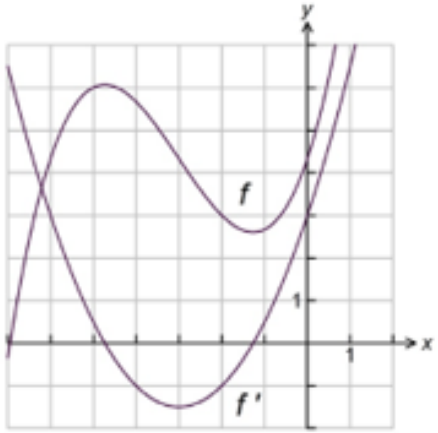


Determine an equation of the tangent to the graph of f at the point where $x = -2$.

5 marks

f and its derivative *f* ’

The diagram below shows the graph of a function *f* and the graph of the derivative *f* ′ of *f*.



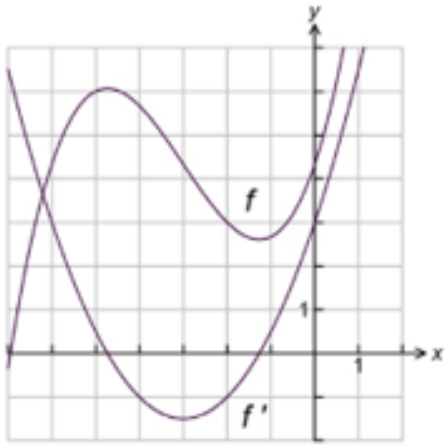
Determine an equation of the tangent to the graph of *f* at the point where $x = -2$.

5 marks

Element of Examination	Question	Learning Objective (specific syllabus reference(s))	Paper-specific Marking Scheme				
			Knowledge and Comprehension	Methods	Problem Solving	Interpretation and Linking	M

https://www.mentimeter.com/app

The diagram below shows the graph of a function f and the graph of the derivative f' of f.



Determine an equation of the tangent to the graph of f at the point where $x = -2$. 5 marks

$y-f(a)=f'(a)(x-a)$

$y-f(-2)=f'(-2)(x+2)$

$f(-2)= 3$
$f'(-2)=-1$

$y-3=-(x+2)$
$y-3=-x-2$
$y=-x-2+3$
$y=-x+1$

Know the formula for a tangent to a graph

Apply the formula

Determine (read) on the graph

Apply the values to the formula

Calculate and reduce

EUROPEAN BACCALAUREATE - MA 3P (JUNE 2021) Written Exam Matrix

Element of Examination	Question	Learning Objective (specific syllabus reference(s))	Paper-specific Marking Scheme				
			Knowledge and Comprehension	Methods	Problem Solvng	Interpretation and Linking	Σ
Non Calculator							

2 3

The tool:

editable matrices

5P & 3P

In three languages

EN, FR, DE

EUROPEAN BACCALAUREATE - 5 Period Maths Competency Matrix

Element of Examination	Question	Learning Objective (specific syllabus reference(s))	Paper-specific Marking Scheme				
			Knowledge and Comprehension	Processes	Problem Solvng	Interpretation and Linking	Σ
Part A - Non Calculator							
Analysis	A1						0,0
Geometry	A2						0,0
Probability	A3						0,0
Sequences	A4						0,0
Complex Numbers	A5						0,0
Analysis or Geom or Prob	A6						0,0
Analysis or Geom or Prob	A7						0,0
Total Part A - Non Calculator							
		S	0,0	0,0	0,0	0,0	0,0
		%	0,0	0,0	0,0	0,0	
		Guideline:	7,5	12,0	9,0	1,5	30,0
		%	25,0	40,0	30,0	5,0	
		Tolerance (Points):	1,0	2,0	2,0	1,0	

The tool:

editable matrices

5P & 3P

In three languages

EN, FR, DE

EUROPEAN BACCALAUREATE - 5 Period Maths Competency Matrix

Element of Examination	Question	Learning Objective (specific syllabus reference(s))	Paper-specific Marking Scheme				
			Knowledge and Comprehension	Processes	Problem Solvng	Interpretation and Linking	Σ
Non Calculator							
Analysis	A1						0,0
Geometry	A2						0,0
Probability	A3						0,0
Sequences	A4						0,0
Complex Numbers	A5						0,0
Analysis or Geom or Prob	A6						0,0
Analysis or Geom or Prob	A7						0,0
Total Non Calculator							
		S	0,0	0,0	0,0	0,0	0,0
		%	0,0	0,0	0,0	0,0	
		Guideline:	7,5	12,0	9,0	1,5	30,0
		%	25,0	40,0	30,0	5,0	
		Tolerance (Points):	1,0	2,0	2,0	1,0	
Calculator							
B1							0,0
Analysis							0,0
							0,0
Minimum 4 sub-questions							0,0
							0,0
							0,0
							0,0
Maximum 8 sub-questions							0,0
		S	0,0	0,0	0,0	0,0	0,0
		%	0,0	0,0	0,0	0,0	
		Guideline:	5,0	8,0	6,0	1,0	20,0
		%	25,0	40,0	30,0	5,0	
		Tolerance (Points):	2,0	4,0	3,0	1,0	
B2							0,0
Geometry							0,0
							0,0
Minimum 4 sub-questions							0,0
							0,0
							0,0
							0,0
Maximum 8 sub-questions							0,0
		S	0,0	0,0	0,0	0,0	0,0
		%	0,0	0,0	0,0	0,0	
		Guideline:	5,0	8,0	6,0	1,0	20,0
		%	25,0	40,0	30,0	5,0	
		Tolerance (Points):	2,0	4,0	3,0	1,0	

The fields marked in yellow can be filled in, all others are protected.

The Sums are marked in different colors:	Green	OK
	Orange	Within tolerance
	Red	Review

For each individual question in the calculator paper (B1,B2 etc.) there is more flexibility in the spread of the marks but the overall weighting of the marks for the whole calculator paper must be respected.

General principle

For each individual question, there is more flexibility in the spread of the marks.

Nevertheless, the overall weighting of the marks for the whole paper must be respected.

7. Resources available in three languages

ENGLISH

An Introduction to the Mathematics Assessment Matrix

1) Video: What is the matrix and how does it relate to the NMS?

https://eursc-my.sharepoint.com/:v:/g/personal/cookdasi_teacher_eursc_eu/Ec7NoBUG4xBEn5XBejt0VhgBc4kYLvzskEN878jnyHTQsg?e=a3gdmG

2) Video: Using the matrix

https://eursc-my.sharepoint.com/:v:/g/personal/cookdasi_teacher_eursc_eu/ET_f9khOVVFAq9fhQGk7IYkBdQuQCd2zcTBXQFsi9tnhFg?e=TJjX0K

3) Form: Practice the ideas outlined in the second video

https://forms.office.com/Pages/ResponsePage.aspx?id=aeA505McU0OzBwsicDW6QhcklDymTFlBo_zMjjyL-ppUOTNRU0U0SFVHU1JVNkdSNFA3SDFMRFYxNy4u

4) Form: Questions, Comments and Feedback

https://forms.office.com/Pages/ResponsePage.aspx?id=aeA505McU0OzBwsicDW6QhcklDymTFlBo_zMjjyL-ppUN0hSNFRXUjZHSEdOM0RSUEhDVVFBOFVYTS4u

Resources available in three languages.

FRENCH

Une introduction à la matrice d'évaluation mathématique

1. **Vidéo : Le nouveau système de notation en mathématiques**

   https://eursc-my.sharepoint.com/:v:/g/personal/cookdasi_teacher_eursc_eu/EW44ajNA5lNFvGj0ul50IdEBa-YnVEoZfB1-2cBJVwu9mw?e=lw8fcW

2. **Vidéo : L'utilisation de la matrice**

   https://eursc-my.sharepoint.com/:v:/g/personal/cookdasi_teacher_eursc_eu/EbVuc7VQDrlJmG0mI5UOiXMBCvPi_wNALc-TDFsLUOE1Aw?e=jkbeuK

3. **Trois exercices pour créer une matrice en mathématiques**

   https://forms.office.com/Pages/ResponsePage.aspx?id=aeA505McU0OzBwsicDW6QhcklDymTFlBo_zMjjyL-ppUQVpNNEszTFRVQUhKUEoyWVBPME8xTUFNMS4u

4. **Formulaire : Questions, commentaires et feedback**

   https://forms.office.com/Pages/ResponsePage.aspx?id=aeA505McU0OzBwsicDW6QhcklDymTFlBo_zMjjyL-ppUOTA1RzVXOEFBSVNKQjUzRTRFSjBOQ01MQS4u

Resources available in three languages.

GERMAN

Eine Einführung in die mathematische Bewertungsmatrix

1. **Video: Bewertung im Fach Mathematik – NMS**

   https://eursc-my.sharepoint.com/:v:/g/personal/cookdasi_teacher_eursc_eu/EVLX30ol9kVPrKRUhI6BTCoBAJkbwo77wVEBPdmqMZHVqQ?e=vb0VJ1

2. **Video: Nutzung der Matrix**

   https://eursc-my.sharepoint.com/:v:/g/personal/cookdasi_teacher_eursc_eu/EXjOVrxezKFOheYLggBfS4UB150mqtqNa31RXvC0Rh-NOw?e=DWQdZ8

3. **Drei Übungen zur Erstellung einer Matrix im Fach Mathematik**

   https://forms.office.com/Pages/ResponsePage.aspx?id=aeA505McU0OzBwsicDW6QhcklDymTFlBo_zMjjyL-ppURE83R1BWVzVNNEtYT09QU0lKR0xVRldMNC4u

4. **Formular: Fragen, Kommentare und Feedback**

   https://forms.office.com/Pages/ResponsePage.aspx?id=aeA505McU0OzBwsicDW6QhcklDymTFlBo_zMjjyL-ppUQUlTVlIySFpRQ1FHTjMyWENZOEk1M0c1SS4u

Thank you for

listening …

for this first part !

Nelson Mandela