

Mathematics assessed student work

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Diploma Programme

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IB mission statement

The International Baccalaureate aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect.

To this end the organization works with schools, governments and international organizations to develop challenging programmes of international education and rigorous assessment.

These programmes encourage students across the world to become active, compassionate and lifelong learners who understand that other people, with their differences, can also be right.



IB learner profile

The aim of all IB programmes is to develop internationally minded people who, recognizing their common humanity and shared guardianship of the planet, help to create a better and more peaceful world.

As IB learners we strive to be:

INQUIRERS

We nurture our curiosity, developing skills for inquiry and research. We know how to learn independently and with others. We learn with enthusiasm and sustain our love of learning throughout life.

KNOWLEDGEABLE

We develop and use conceptual understanding, exploring knowledge across a range of disciplines. We engage with issues and ideas that have local and global significance.

THINKERS

We use critical and creative thinking skills to analyse and take responsible action on complex problems. We exercise initiative in making reasoned, ethical decisions.

COMMUNICATORS

We express ourselves confidently and creatively in more than one language and in many ways. We collaborate effectively, listening carefully to the perspectives of other individuals and groups.

PRINCIPLED

We act with integrity and honesty, with a strong sense of fairness and justice, and with respect for the dignity and rights of people everywhere. We take responsibility for our actions and their consequences.

OPEN-MINDED

We critically appreciate our own cultures and personal histories, as well as the values and traditions of others. We seek and evaluate a range of points of view, and we are willing to grow from the experience.

CARING

We show empathy, compassion and respect. We have a commitment to service, and we act to make a positive difference in the lives of others and in the world around us.

RISK-TAKERS

We approach uncertainty with forethought and determination; we work independently and cooperatively to explore new ideas and innovative strategies. We are resourceful and resilient in the face of challenges and change.

BALANCED

We understand the importance of balancing different aspects of our lives—intellectual, physical, and emotional—to achieve well-being for ourselves and others. We recognize our interdependence with other people and with the world in which we live.

REFLECTIVE

We thoughtfully consider the world and our own ideas and experience. We work to understand our strengths and weaknesses in order to support our learning and personal development.

The IB learner profile represents 10 attributes valued by IB World Schools. We believe these attributes, and others like them, can help individuals and groups become responsible members of local, national and global communities.

Overview

The intention of this section is to demonstrate the overall marking standards that are required, as well as to illustrate how the achievement levels for each criterion should be awarded. The assessment was undertaken by experienced moderators.

The comments and marks provided for criteria A–E are those of these moderators. All the explorations have been marked using both the standard level (SL) and higher level (HL) criteria. The requirements for criteria A–D are identical for SL and HL; it is only criterion E (use of mathematics) that is different. It is essential that teachers of both subjects and levels standardize their marking of the exploration before submitting their marks.

Some of the explorations have separate comments for mathematics: analysis and approaches and for mathematics: applications and interpretation. This is to illustrate how the marking may be affected based on whether a student has met the mathematics used during their course or has chosen to use mathematics not from their course. Generally, this may affect the mark given in criterion C (personal engagement).

Teachers may simply wish to see how an exploration was marked. Using the links, teachers can navigate to the comments and to the annotated student work. The annotated work shows, for each criterion, where in the exploration evidence can be seen for reaching a decision on awarding the mark for that criterion.

Alternatively, teachers may wish to mark the student work themselves. Using the links, the student work can also be viewed in its original format. Teachers can then compare their own marking to that of the moderator and go on to look at the annotated student work.

The comments should be read in conjunction with the explorations and the annotations on the explorations.

The table below categorizes the explorations by the “best fit” for the topic of the exploration and shows the marks given for SL (first number) and HL (second number). When a cell is split in two, the top part shows the marks for mathematics: analysis and approaches (analysis) and the bottom part shows the marks for mathematics: applications and interpretation (applications).

Samples 30 to 49 were written by students following one of the DP mathematics courses first taught in 2019. The samples are grouped as follows:

30–34	DP mathematics: applications and interpretation SL
35–39	DP mathematics: analysis and approaches SL
40–44	DP mathematics: applications and interpretation HL
45–49	DP mathematics: analysis and approaches HL

Example number	Title	Number and algebra	Functions (and modelling)	Geometry and trigonometry	Probability and statistics	Calculus	Other
1	Horse's jump		SL 11 marks HL 9 marks				
2	Infant mortality				SL 16 marks HL 14 marks		

Example number	Title	Number and algebra	Functions (and modelling)	Geometry and trigonometry	Probability and statistics	Calculus	Other
3	Packaging and geometrical shapes			SL 14 marks HL 12 marks			
4	Rowing speeds				SL 16 marks HL 15 marks		
5	Social media				SL 9 marks HL 7 marks		
6	Path of quickest descent		SL 9 marks HL 8 marks				
7	Bayes' Theorem and baseball				SL 10 marks HL 9 marks		
8	Modelling stools					SL 13 marks HL 11 marks	
9	The Cantor set						SL 12 marks HL 11 marks
10	Human population growth		Analysis SL 16 marks Analysis HL 15 marks Applications SL 16 marks Applications HL 15 marks				
11	Pursuit curves					SL 15 marks HL 14 marks	
12	Microwave popcorn		SL 20 marks HL 20 marks				
13	Ice cream					SL 15 marks HL 13 marks	
14	Zeno's arrow paradox					SL 18 marks HL 17 marks	
15	Chinese remainder theorem	SL 12 marks HL 11 marks					
16	Solar panels			SL 20 marks HL 20 marks			
17	Hyperboloids			SL 19 marks HL 19 marks			

Example number	Title	Number and algebra	Functions (and modelling)	Geometry and trigonometry	Probability and statistics	Calculus	Other
18	Prime number theories	SL 10 marks HL 8 marks					
19	Optimisation at the cottage					SL 11 marks HL 9 marks	
20	Encrypting messages	Analysis SL 17 marks Analysis HL 15 marks Applications SL 16 marks Applications HL 14 marks					
21	Gabriel Dawe's rainbow coloured curves		SL 19 marks HL 18 marks				
22	Titus tunnel bridge		SL 19 marks HL 18 marks				
23	Transport fare charges in Madrid		SL 15 marks HL 14 marks				
24	Golf and kinematics		SL 7 marks HL 7 marks				
25	Mathematics in barcodes	SL 13 marks HL 12 marks					
26	Probability in the courtroom				SL 19 marks HL 18 marks		
27	Converting piano music to guitar music		SL 11 marks HL 10 marks				
28	The Chinese postman problem: analysis	Analysis SL 14 marks HL 14 marks					
29	Real-world applications of the prisoner's dilemma				SL 10 marks HL 9 marks		
30	Airline overbooking				SL 19 marks HL 17 marks		
31	Volleyball spike			SL 16 marks HL 14 marks			

Example number	Title	Number and algebra	Functions (and modelling)	Geometry and trigonometry	Probability and statistics	Calculus	Other
32	Optimum age for 100m sprint				SL 15 marks HL 14 marks		
33	Volume of a chess pawn					SL 17 marks HL 15 marks	
34	Sentence length and genre of novel				SL 14 marks HL 13 marks		
35	Paracetamol tablet optimization					SL 20 marks HL 18 marks	
36	Internal temperature of cookies		SL 18 marks HL 16 marks				
37	Towers of Hanoi extension	SL 16 marks HL 14 marks					
38	Morphine in pharmacokinetics					SL 15 marks HL 13 marks	
39	Voters of tomorrow				SL 17 marks HL 15 marks		
40	Radioactive modelling					SL 19 marks HL 18 marks	
41	Travelling salesman and a trip around India			SL 15 marks HL 13 marks			
42	Terrarium design for garden spiders		SL 15 marks HL 13 marks				
43	Perishable and non-perishable goods				SL 17 marks HL 16 marks		
44	Ethnicity spread and crime rate				SL 17 marks HL 16 marks		
45	Radii of curvature					SL 18 marks HL 17 marks	
46	Robotic arm		SL 18 marks HL 17 marks				
47	Efficiency of sun visors			SL 14 marks HL 13 marks			
48	Path of a violin bow frog			SL 18 marks HL 17 marks			

Example number	Title	Number and algebra	Functions (and modelling)	Geometry and trigonometry	Probability and statistics	Calculus	Other
49	How can we make it better?					SL 16 marks HL 15 marks	

Spreadsheet summary of assessed student work

This [downloadable spreadsheet](#) provides summary data on each piece of assessed student work. The spreadsheet can be adapted as required to your own school's needs.

Each column can be filtered and sorted using the small arrow button at the top of the column. Clicking this opens the dialog window for filtering and sorting (Figure 1).

Figure 1

Columns can be filtered and sorted according to different parameters

	A	B	C	D	E	F	G	H
	Ex	Title	SL	HL	p	Content area	Secondary content	Model
2	1	Horse's jump	11	9	15	Modelling		
3	2	Infant mortality	16	14	30	Probability and		
4	3	Packaging and geometric shapes	14	12	15	Geometry and		
5	4	Rowing speeds	16	15	19	Probability and		
6	5	Social media	9	7	26	Probability and		
7	6	Path of quickest descent	9	8	17	Modelling		
8	7	Bayes' theorem and baseball	10	9	11	Probability and		
9	8	Modelling stools	13	11	15	Calculus		
10	9	The Cantor set	12	11	9	Other		
11	10	Human population growth	16	15	20	Modelling		
12	11	Pursuit curves	15	14	12	Calculus		
13	12	Microwave popcorn	20	20	14	Modelling		
14	13	Ice cream	15	13	15	Calculus		
15	14	Zeno's arrow paradox	18	17	12	Calculus		
16	15	Chinese remainder theorem	12	11	12	Algebra		
17	16	Solar panels	20	20	24	Geometry and		
18	17	Hyperboloids	19	19	16	Geometry and		
19	18	Prime number theories	10	8	11	Algebra		
20	19	Optimisation at the cottage	11	9	5	Calculus		
21	20	Encrypting messages	17/16	15/14	14	Algebra		
22	21	Gabriel Dawe's rainbow colored curves	19	18	12	Modelling		
23	22	Titus tunnel bridge	19	18	16	Modelling		
24	23	Transport fare charges in Madrid	15	14	17	Modelling	Functions	

Sorting by score (SL/HL)

Clicking the down arrow on the SL or HL column offers two options, "Sort Smallest to Largest" or "Sort Largest to Smallest". This could be used, for example, to find high scoring or low scoring HL explorations.

Note: Some examples may have different totals for the two DP mathematics subjects.

Sorting by page count

Sometimes it is helpful to discuss lack of conciseness—or its opposite, the need for more detail—with students. Sorting the examples by page count can be a starting point for this.

Sorting by secondary content

Example IAs can be sorted by their primary and secondary content. This could be used to identify, for example, student work that used calculus as its primary content and a different area as its secondary content.

Additional notes can be added to the column: for example, notes on modelling, problem solving, specific techniques.

Sorting by use of technology

Specific technologies used in the examples were classified using the IB document “Learning, teaching and leading with technologies” (pages 10–12). The most commonly occurring classifications are defined below:

- Databases (DB)—Repositories of information that can be accessed for research and data collection.
- Survey tools (ST)—Tools used to make surveys.
- Drawing tools (DT)—Tools used for drawing new images, colouring and shape-making. These can include dynamic geometry software such as GeoGebra and Desmos.
- Screen-capture tools (Scr)—Tools that take images of a screen.
- Simulations (Sim)—Tools that use data to create virtual scenarios or to test hypotheses about how systems work over time. These can include programming languages such as Python or Javascript.
- Spreadsheets (Spr)—Digital tools that arrange data in rows and columns that can be manipulated and used in graphs and calculations.

Note: Word processing tools and calculation tools are common to many examples and are not included in the list.

Sorting by criteria achievement levels

Sorting the examples by achievement level within each criterion identifies the high scoring and low scoring examples for that criterion.

It can be useful to discuss how and why students achieved high scores in some criteria, and how weak-scoring criteria could have been improved. For example, some of the higher scoring examples may be reasonably strong in certain criteria, but quite weak in others. Similarly, where two examples achieve the same level in a certain criterion but are about very different topics, it can be useful to discuss how the common—or different—approaches to the work lead to this same result.

Comments column

The “Comments” column can be used to add extra information about the examples, e.g. specific mathematical techniques and methods used in the internal assessment.

Example 1: Horse's jump

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 2: Infant mortality

Subject: Mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 3: Packaging and geometrical shapes

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 4: Rowing speeds

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level and (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 5: Social media

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 6: Path of quickest descent

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 7: Bayes' Theorem and baseball

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 8: Modelling stools

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 9: The Cantor set

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 10: Human population growth

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 11: Pursuit curves

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 12: Microwave popcorn

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 13: Ice cream

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 14: Zeno's arrow paradox

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 15: Chinese remainder theorem

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 16: Solar panels

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 17: Hyperboloids

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 18: Prime number theories

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 19: Optimisation at the cottage

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment (IA), standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 20: Encrypting messages

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 21: Gabriel Dawe's rainbow coloured curves

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 22: Titus tunnel bridge

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 23: Transport fare charges in Madrid

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 24: Golf and kinematics

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 25: Mathematics in barcodes

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 26: Probability in the courtroom

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 27: Converting piano music to guitar music

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 28: The Chinese postman problem: analysis

Subject: Mathematics: analysis and approaches

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 29: Real-world applications of the prisoner's dilemma

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 30: Airline overbooking

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

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Example 31: Volleyball spike

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 32: Optimum age for 100m sprint

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 33: Volume of a chess pawn

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 34: Sentence length and genre of novel

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 35: Paracetamol tablet optimization

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 36: Internal temperature of cookies

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 37: Towers of Hanoi extension

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

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Example 38: Morphine in pharmacokinetics

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 39: Voters of tomorrow

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

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Example 40: Radioactive modelling

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

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Example 41: Travelling salesman and a trip around India

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 42: Terrarium design for garden spiders

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

[Examiner's comments coversheet \(PDF\)](#)

Example 43: Perishable and non-perishable goods

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

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Example 44: Ethnicity spread and crime rate

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

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Example 45: Radii of curvature

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

[Annotated student work \(PDF\)](#)

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Example 46: Robotic arm

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

[Student work \(PDF\)](#)

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Example 47: Efficiency of sun visors

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

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[Annotated student work \(PDF\)](#)

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Example 48: Path of a violin bow frog

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

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[Annotated student work \(PDF\)](#)

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Example 49: How can we make it better?

Subject: Mathematics: analysis and approaches and mathematics: applications and interpretation

Paper component: Internal assessment, standard level (SL) and higher level (HL)

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[Examiner's comments coversheet \(PDF\)](#)

Updates to the publication

This section outlines the updates made to this publication over the past two years. The changes are ordered from the most recent to the oldest updates. Minor spelling and typographical corrections are not listed.

Corrections for June 2023

Assessed student work > Overview

[“Spreadsheet summary of assessed student work”](#)

This new subsection describes the features of the new downloadable spreadsheet. The spreadsheet provides a range of data on the assessed student work, e.g. scores by criteria, use of technology.