INTERNATIONAL ACAC

INTERNATIONAL ASSOCIATION FOR COLLEGE ADMISSION COUNSELING

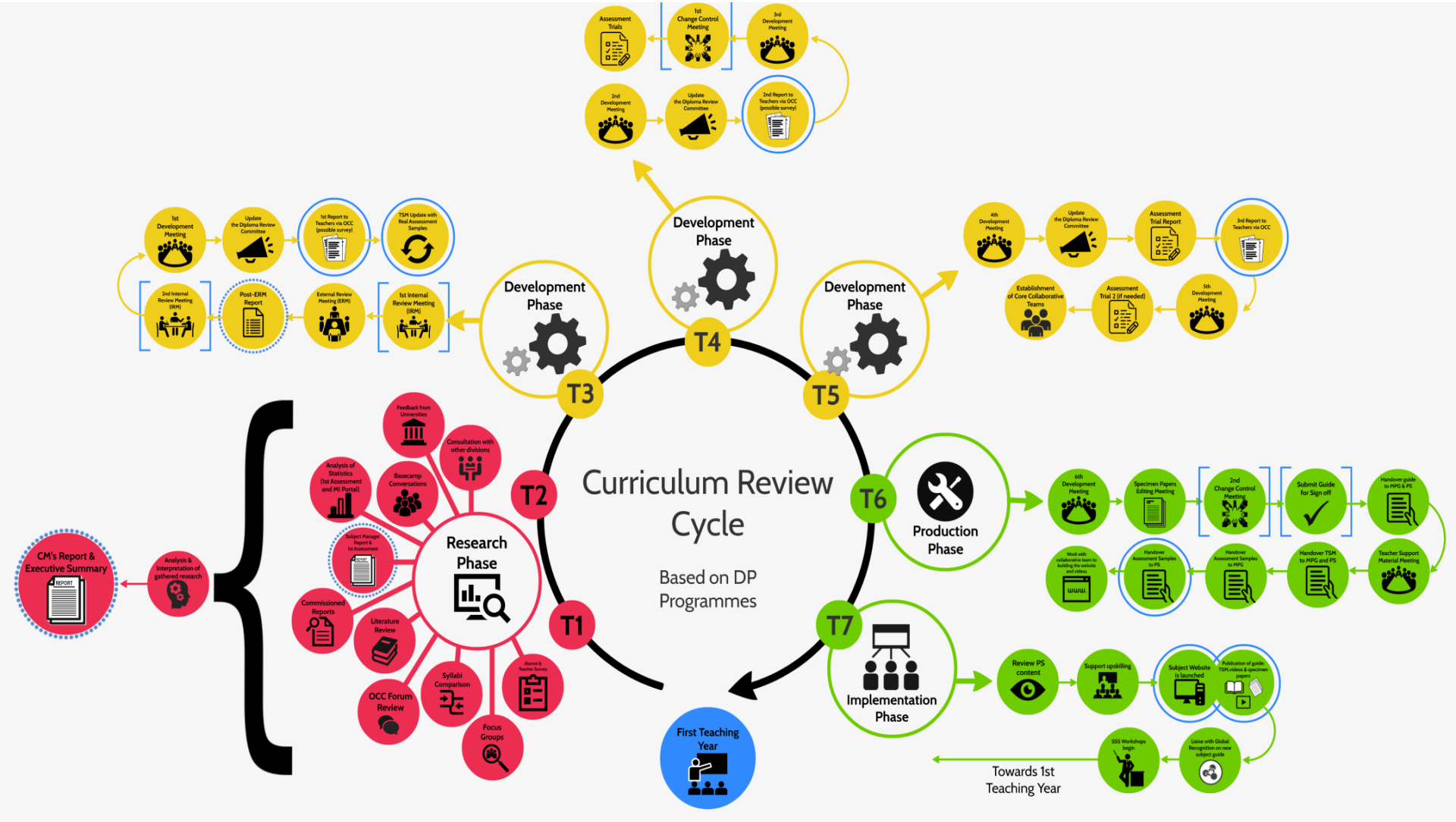
WEBINAR WEDNESDAY

IB Insights: The New IB Math Curriculum and University Considerations

October 3, 2018 - Session I

Panelists

- **Peter Chetwynd**, King's College London, United Kingdom
- **Panetha Ott**, Brown University, United States
- **Merike Remmel**, University of Toronto, Canada
- **Holly Smith**, University of Sussex, United Kingdom
- **Deborah Sutch**, International Baccalaureate Organization, The Netherlands
- **Marie Vivas**, International Baccalaureate Organization, United States


Curriculum Review Cycle
Based on DP Programmes
T1
T2
T3
T4
T5
T6
T7
Research Phase
Development Phase
Development Phase
Development Phase
Production Phase
Implementation Phase
First Teaching Year
Towards 1st Teaching Year
CM's Report & Executive Summary
Analysis & Interpretation of gathered research
Feedback from Universities
Consultation with other divisions
Basecamp Conversations
Analysis of Statistics (1st Assessment and MI Portal)
Subject Manager Report & 1st Assessment
Commissioned Reports
Literature Review
Syllabi Comparison
Alumni & Teacher Survey
Focus Groups
OCC Forum Review
Assessment Trials
1st Change Control Meeting
3rd Development Meeting
2nd Development Meeting
Update the Diploma Review Committee
2nd Report to Teachers via OCC (possible survey)
1st Development Meeting
Update the Diploma Review Committee
1st Report to Teachers via OCC (possible survey)
TSM Update with Real Assessment Samples
2nd Internal Review Meeting (IRM)
Post-ERM Report
External Review Meeting (ERM)
1st Internal Review Meeting (IRM)
4th Development Meeting
Update the Diploma Review Committee
Assessment Trial Report
3rd Report to Teachers via OCC
Establishment of Core Collaborative Teams
Assessment Trial 2 (if needed)
5th Development Meeting
6th Development Meeting
Specimen Papers Editing Meeting
2nd Change Control Meeting
Submit Guide for Sign off
Handover guide to MPG & PS
Work with collaborative team to building the website and videos
Handover Assessment Samples to PS
Handover Assessment Samples to MPG
Handover TSM to MPG and PS
Teacher Support Material Meeting
Review PS content
Support upskilling
Subject Website is launched
Publication of guides, TSM, videos & specimen papers
SSS Workshops begin
Liaise with Global Recognition on new subject guide

What's changing?

Currently

Four mathematics subjects are offered.

- Further mathematics HL
- Mathematics HL
- Mathematics SL
- Mathematical studies SL

Final assessment of these subjects will take place in November 2020.

New

First teaching August 2019, first assessment in May 2021.

Two subjects each offered at HL and SL will increase accessibility to more students, appeal to their interests and cater for their future needs.

- Mathematics: analysis and approaches (HL and SL)
- Mathematics: applications and interpretation (HL and SL)

HL and SL: Mathematics: Analysis and approaches

- **Analytic methods** with an emphasis on calculus – appropriate for pure mathematicians, engineers, scientists, economists, those with an interest in analytic methods – current HL mathematics calculus option content will form part of the HL course. This subject is aimed at students who will go on to study subjects with substantial mathematics content such as mathematics itself, engineering, physical sciences, or some economics

Syllabus component	Recommended teaching hours	
	SL	HL
• Number and algebra	19	39
• Functions	21	32
• Geometry and trigonometry	25	51
• Statistics and probability	27	33
• Calculus	28	55
Development of investigational, problem-solving and modelling skills and the exploration	30	30
Total teaching hours	**150**	**240**

HL and SL: Mathematics: Applications and interpretation

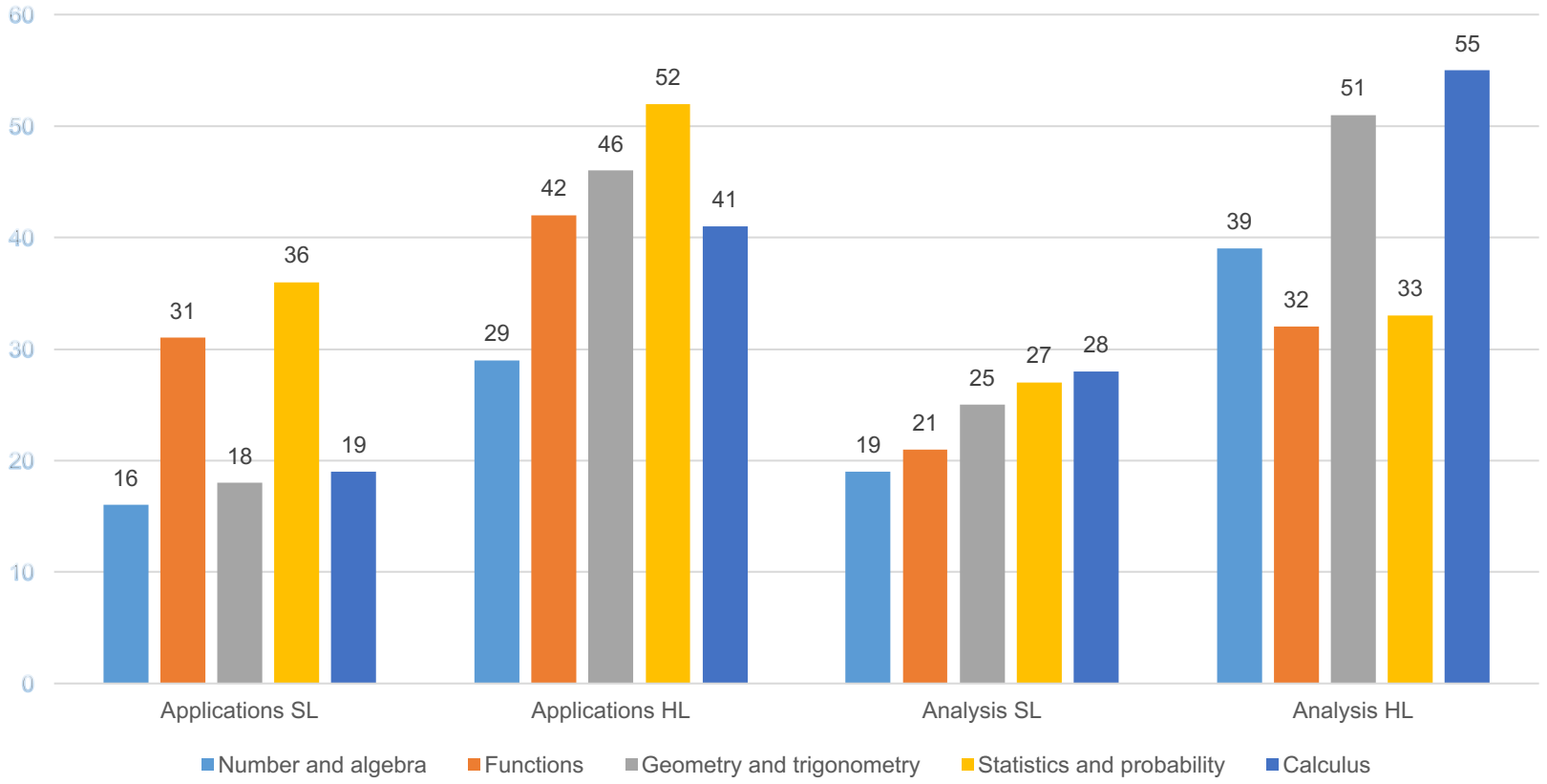
- **Applications and interpretation** with an emphasis on statistics, modelling and use of technology – appropriate for those with an interest in the applications of mathematics and how technology can support this – SL will be appropriate for students who would previously have taken Mathematical studies SL – current HL mathematics statistics and discrete option content will form part of the HL course. This subject is aimed at students who will go on to study subjects such as social sciences, natural sciences, medicine, statistics, business, some economics courses, psychology, and design.

Syllabus component	Recommended teaching hours SL	HL
• Number and algebra	16	29
• Functions	31	42
• Geometry and trigonometry	18	46
• Statistics and probability	36	52
• Calculus	19	41
Development of investigational, problem-solving and modelling skills and the exploration	30	30
Total teaching hours	**150**	**240**

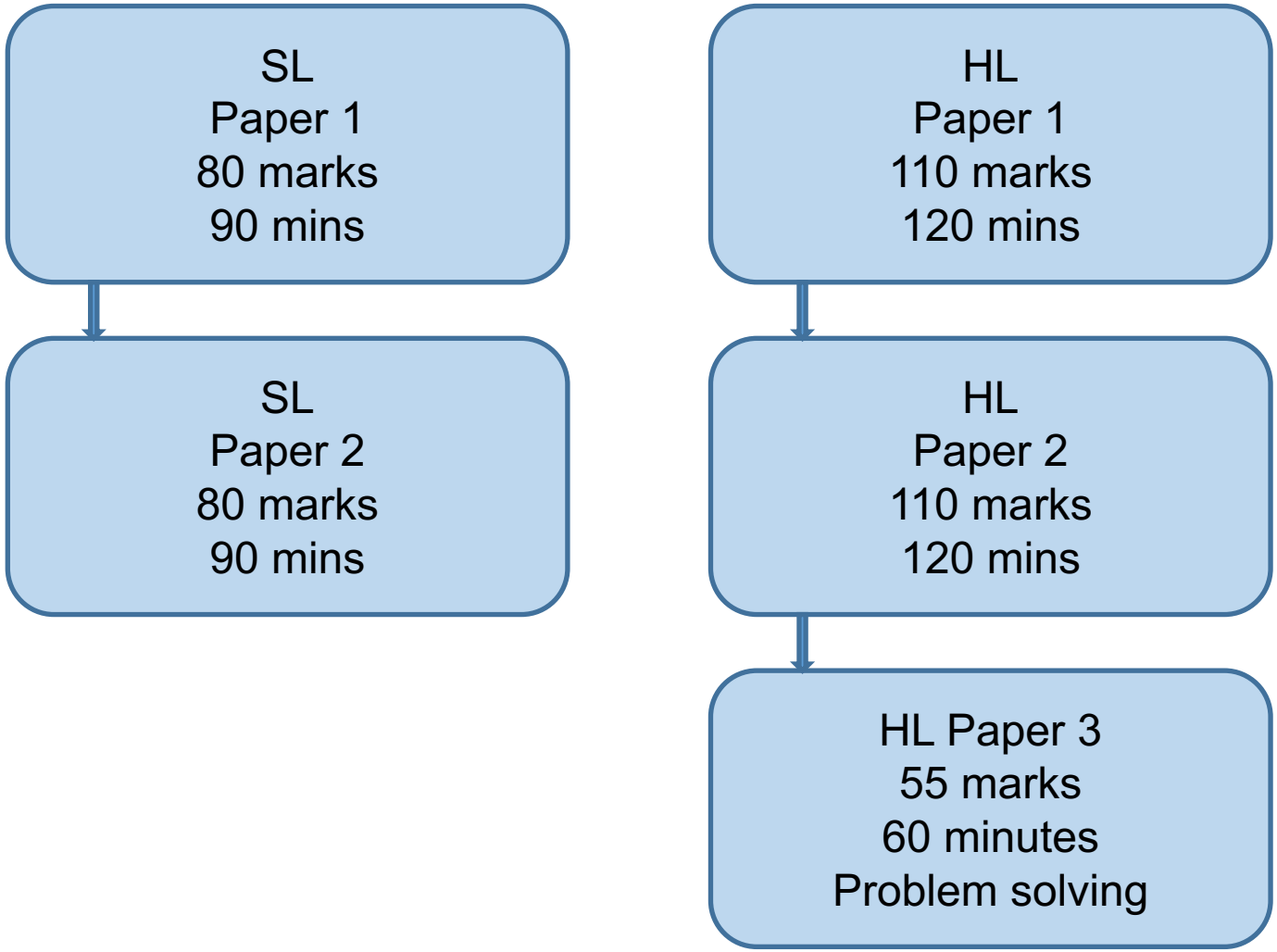
Rationale for the changes

- Greater choice for students
- Changing needs of the world of work and universities
- Low uptake of Mathematics HL
- Alignment and parity of mathematics within the DP
- Very low uptake of Further mathematics HL
- Perception issues with Mathematical Studies SL
- Increasing emphasis on the use of technology
- To offer schools flexibility in the way they schedule classes
- To offer teachers flexibility in the way they teach the content

The curriculum model



The DP Mathematics assessment model



Five key distinctions in the new curriculum

1) Each subject will be available at SL and HL, with the SL course being a complete subset of the HL course.

2) There will be approximately 60 hours allocated to common SL material across both subject.

3) 30 hours will be allocated to the development of investigational and problem solving skills, collaboration, modelling skills, and completion of the internal assessment (IA) component.

4) The IA is an independent exploration of an area of mathematics chosen by the student. It is internally assessed by the teacher and externally moderated by the IB, contributing 20% to the overall level.

5) HL 3 Paper will be a 1 hour problem-solving/sustained reasoning paper – two scaffolded problems, beginning with a syllabus item and building to either a generalization or an interpretation of the problem

1) Recognition

Universities and government organizations in countries which take the greatest number of IB graduates have been prioritised with on-going dialogues, a steady exchange of documents, and presentations.

2) Publication dates and professional development

- The guides, TSM, specimen papers will be published at the start of February 2019
- Subject specific seminars (SSS) will begin on 15th February 2019 across all the regions – information can be found on ibo.org

3) Pathways into DP Mathematics

- MYP mathematics (first teaching 2020) will have greater alignment with DP mathematics in terms of content, concepts and aims

- MYP extended mathematics, strong GCSE or IGCSE, Algebra II can lead to either DP mathematics HL courses – strong standard level could do either HL

Summary

The new courses will enable students to:

- develop a curiosity and enjoyment of mathematics, and appreciate its elegance, beauty and power
- develop a deep, life-long understanding of the concepts, principles and nature of mathematics
- communicate mathematics clearly, concisely and confidently in a variety of contexts
- develop logical and creative thinking, and patience and persistence in problem-solving to instill confidence in using mathematics
- **And much more**

Helping students make the transition

Grade	Current	Recommendation 1	Recommendation 2	Consider
11	Mathematical studies SL Year 1	Mathematics applications SL Year 1	----	If you have candidates regularly achieving high grades in Mathematical studies SL, consider a combined Mathematics application SL/HL in Year 1 and split the classes SL–HL in year 2. Mathematics applications HL Year 1
12	Mathematical studies SL Year 2	Mathematics applications SL Year 2	----	Mathematics applications HL Year 2
11	Mathematics SL Year 1	Mathematics analysis SL Year 1	----	If you have candidates regularly achieving high grades in Mathematics SL, consider offering Mathematics applications HL Year 1
12	Mathematics SL Year 2	Mathematics analysis SL Year 2	----	Mathematics applications HL Year 2
11	Algebra II	Mathematics applications SL Year 1	----	If you have students taking a state Algebra II examination, consider adding units in 11th grade on areas not covered (about 30%) in the Mathematics applications SL course.
12	Mathematical studies SL (one- year course)	Mathematics applications SL Year 2 **Note:** Mathematics applications SL contains approximately 70% of Algebra II and can be taught without Algebra II as a pre-requisite.	----	

Grade	Current	Recommendation 1	Recommendation 2	Consider
11	Mathematics SL	Mathematics applications HL Year 1	Mathematics applications SL Year 1	Mathematics analysis HL Year 1
12	AP Calculus AB	Mathematics applications HL Year 2 **Note:** This course encompasses most of AP Calculus AB plus additional topics	Mathematics applications SL Year 2 **Note:** This course contains calculus	Mathematics analysis HL Year 2 **Note:** The course encompasses most of AP Calculus BC plus additional topics
11	Mathematical studies SL	Mathematics applications HL Year 1	Mathematics applications SL Year 1	**Note:** Recommendation 1 will include more calculus and all of the college introductory statistics.
12	AP Statistics or College Co-enrolled statistics	Mathematics applications HL Year 2	Mathematics applications SL Year 2	----
11	Mathematics SL	Mathematics applications HL Year 1	----	----
12	AP Statistics	Mathematics applications HL Year 2	----	----
11	Mathematical studies SL	Mathematics applications SL Year 1	Mathematics analysis SL Year 1	If you have candidates regularly achieving high grades in Mathematical studies SL, consider: Mathematics applications HL Year 1
12	AP Calculus or College Co-enrolled calculus	Mathematics applications SL Year 2 **Note:** This course contains calculus.	Mathematics analysis SL Year 2 **Note:** This course includes most of AP Calculus plus additional topics.	Mathematics applications HL Year 2 **Note:** This course encompasses AP Calculus plus AP Statistics plus additional topics.
11	Mathematics SL	Mathematics analysis HL Year 1	Mathematics applications HL Year 1	----
12	AP Calculus BC	Mathematics analysis HL Year 2	Mathematics applications HL Year 2	----
11	Mathematics HL Year 1	Mathematics analysis HL Year 1	Mathematics applications HL Year 1	----
12	Mathematics HL Year 2 (and/or Further mathematics)	Mathematics analysis HL Year 2	Mathematics applications HL Year 2	----

Provocation Questions For Our University Partners

1. What is the process for your institutions to review courses for admissions/credit? Do you have special processes for math?

2. How would you advise students families and counselors on planning their math sequence for IB?

3. What would you like to learn from schools and the IB about the math courses?

BROWN

Panetha Ott

INTERNATIONAL ACAC

WEBINAR WEDNESDAY

Merike Remmel

http://www.math.toronto.edu/preparing-for-calculus/

KING'S College LONDON

Peter Chetwynd

INTERNATIONAL ACAC

WEBINAR WEDNESDAY

UNIVERSITY OF SUSSEX

Holly Smith

INTERNATIONAL ACAC

WEBINAR WEDNESDAY


Q
&
A

Thank you!

- **Peter Chetwynd**, King's College London, United Kingdom
- **Panetha Ott**, Brown University, United States
- **Merike Remmel**, University of Toronto, Canada
- **Holly Smith**, University of Sussex, United Kingdom
- **Deborah Sutch**, International Baccalaureate Organization, The Netherlands
- **Marie Vivas**, International Baccalaureate Organization, United States

INTERNATIONAL ACAC

INTERNATIONAL ASSOCIATION FOR COLLEGE ADMISSION COUNSELING

WEBINAR WEDNESDAY

Next month ….Financial Aid: The intricacies, Common Questions and Lesser Known Hacks

November 14, 2018