



**Advanced Mathematics
Support Programme®**

MEI holds the NCETM CPD Standard

The CPD Standard supports maths teachers to access information about the wide range of CPD provision on offer and to be assured of its appropriateness and quality.

ncetm.org.uk/cpdstandard

Continuing Professional
Development
Standard

National Centre
for Excellence in the
Teaching of Mathematics



Warm up puzzles



Find the value of

$$\frac{5^8 - 3^8}{(5^4 + 3^4)(5^2 + 3^2)}$$

Find the value of k if
 $10! + 9! = 99 \times k!$

$$\begin{aligned} a + b &= 2 \\ a^2 + b^2 &= 6 \end{aligned}$$

What are the values of
 $a^3 + b^3$ and $a^5 + b^5$?

Adapted from the 2020
 STMC national final

$$\begin{aligned}
 \frac{5^8 - 3^8}{(5^4 + 3^4)(5^2 + 3^2)} &= \frac{\cancel{(5^4 + 3^4)}(5^4 - 3^4)}{\cancel{(5^4 + 3^4)}(5^2 + 3^2)} \\
 &= \frac{\cancel{(5^2 + 3^2)}(5^2 - 3^2)}{\cancel{(5^2 + 3^2)}} \\
 &= 16
 \end{aligned}$$

$$\begin{aligned}
 10! + 9! &= 10 \times 9! + 9! \\
 &= 11 \times 9! \\
 &= 99 \times 8! \\
 \therefore k &= 8
 \end{aligned}$$

$$a + b = 2$$

$$a^2 + b^2 = 6$$

$$(a + b)^2 = a^2 + b^2 + 2ab$$

$$2^2 = 6 + 2ab$$

$$ab = -1$$

$$(a + b)(a^2 + b^2) = a^3 + b^3 + ab(a + b)$$

$$2 \times 6 = a^3 + b^3 + (-1) \times 2$$

$$a^3 + b^3 = 14$$

$$(a^2 + b^2)(a^3 + b^3) = a^5 + b^5 + (ab)^2(a + b)$$

$$6 \times 14 = a^5 + b^5 + 1 \times 2$$

$$a^5 + b^5 = 82$$



Further Mathematics Conference 2020

Continuing Professional
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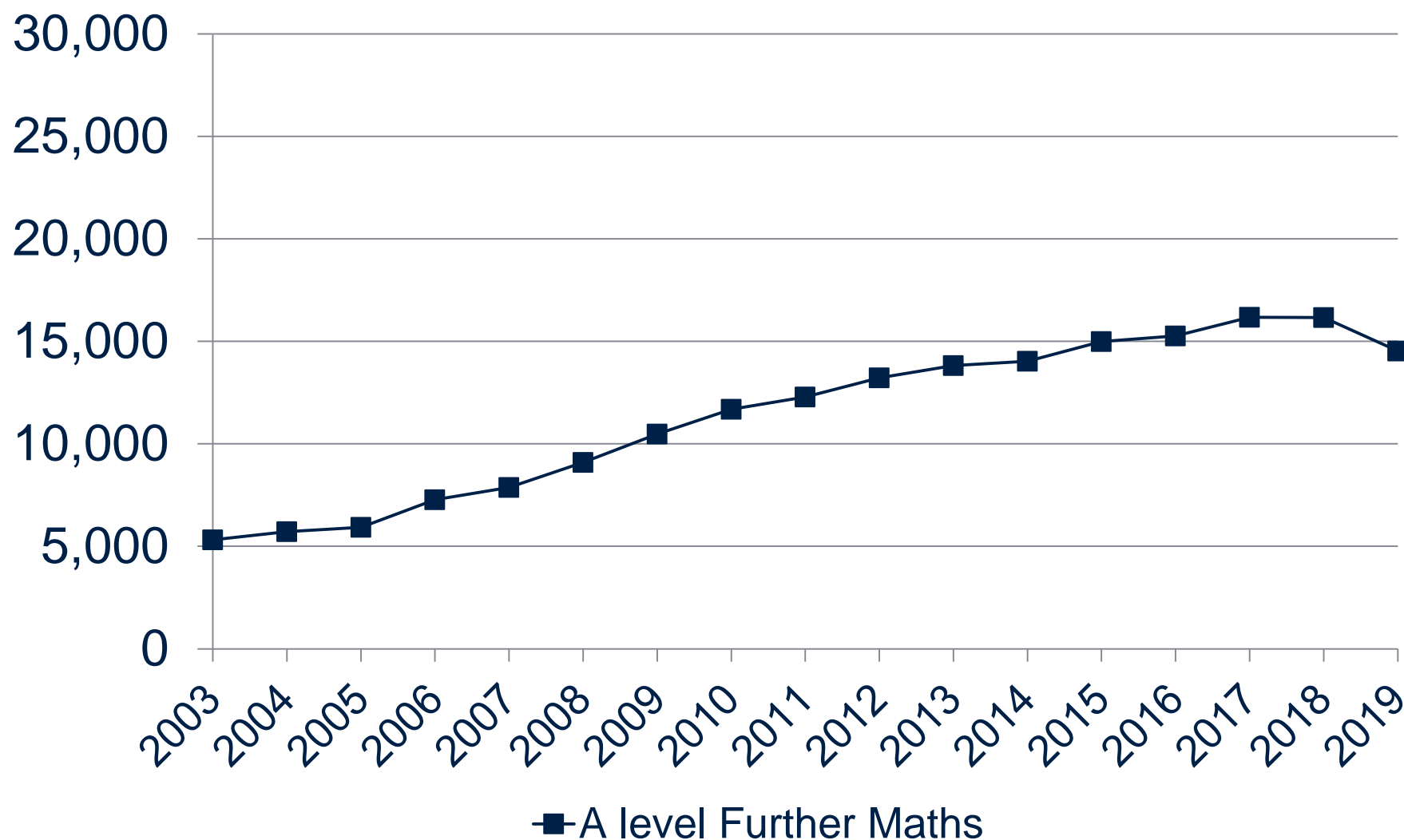
National Centre
for Excellence in the
Teaching of Mathematics



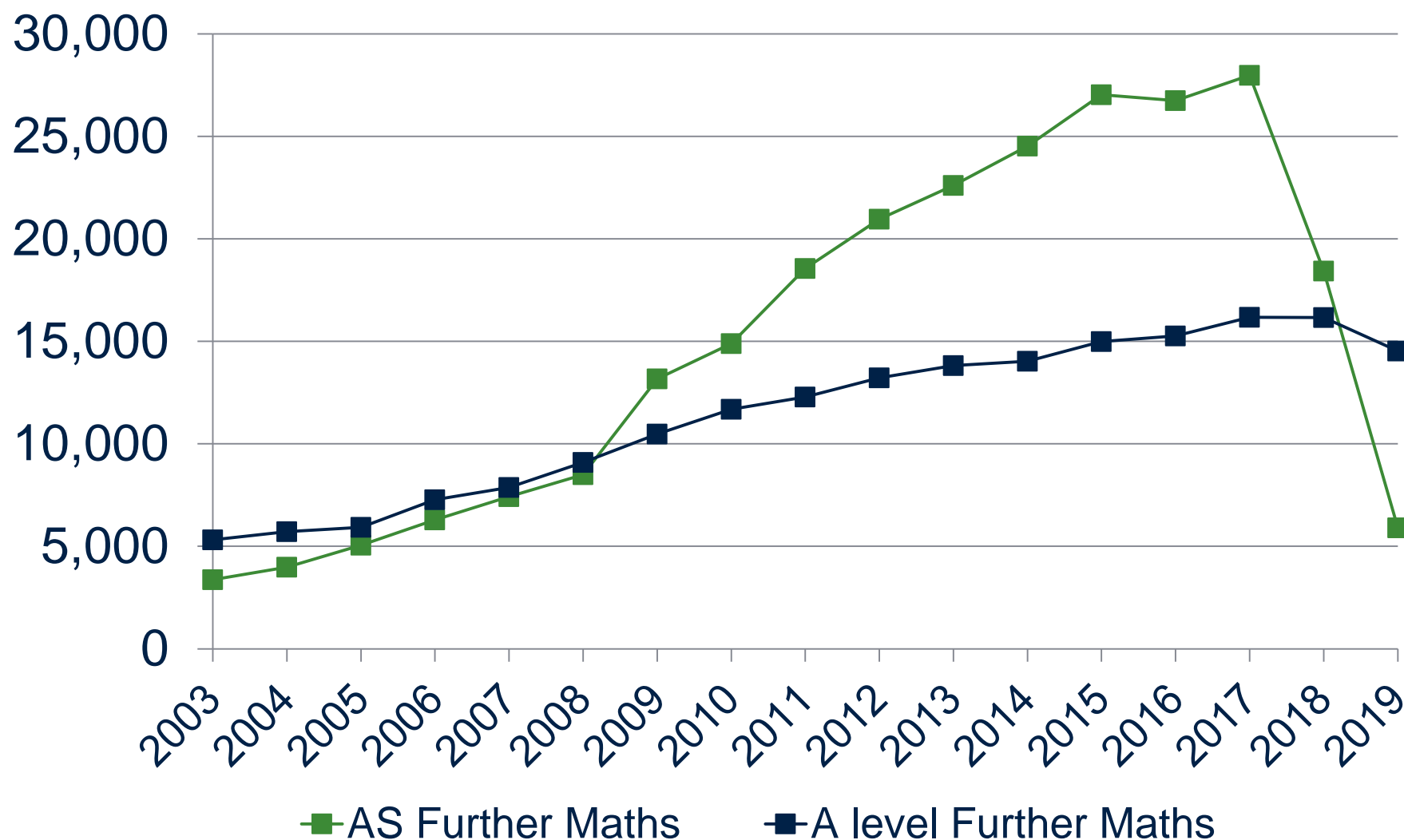
Programme for the day

10:00 – 10:20	Welcome and logistics
10:20 – 11:30	Optional session 1
11:30 – 11:50	Tea/coffee/networking
11:50 – 13:00	Optional session 2
13:00 – 13:50	Lunch
13:50 – 14:20	Plenary session
14:20 – 15:30	Optional session 3
15:30 – 15:40	Tea/coffee/networking
15:40 – 16:00	Closing thoughts

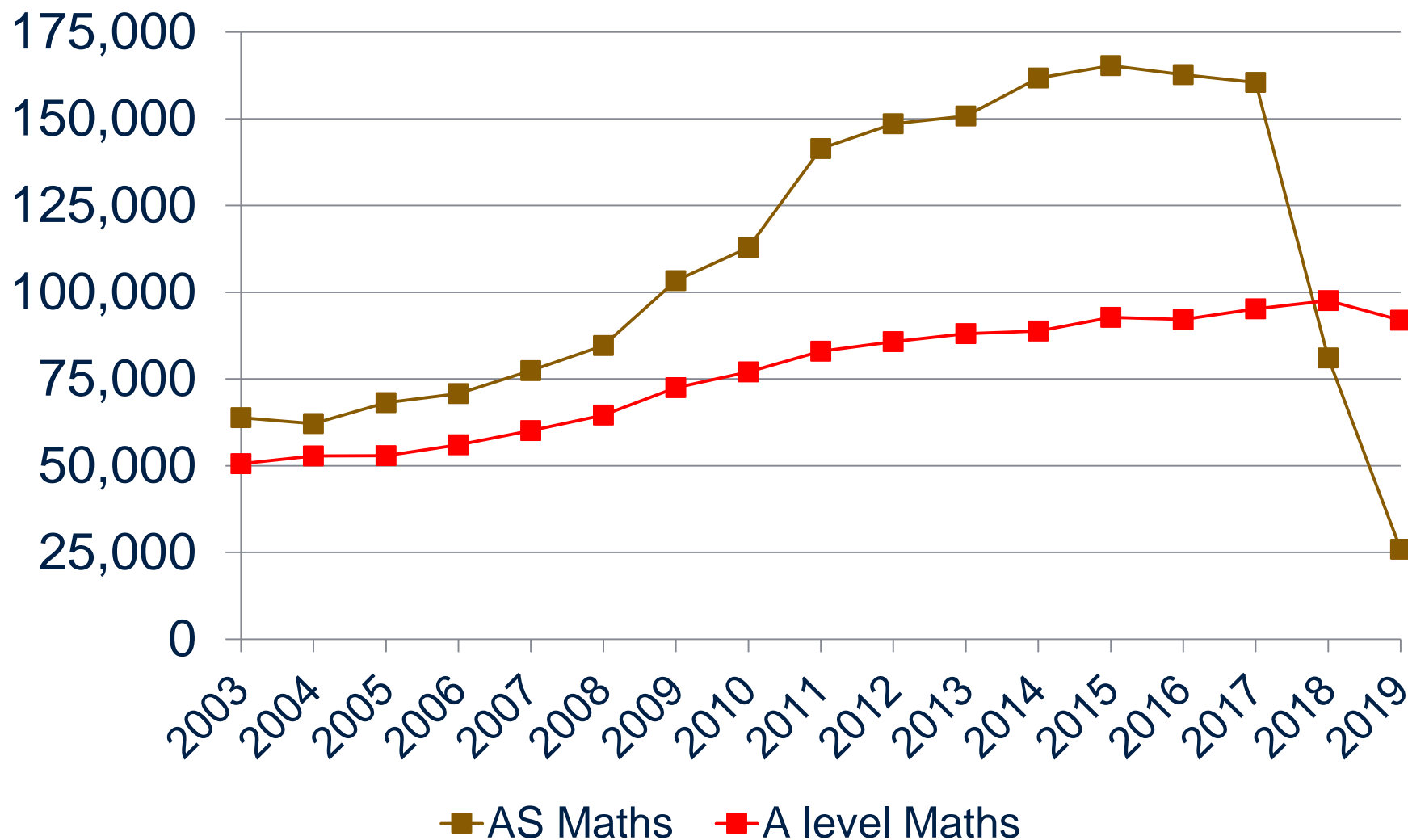
A level Further Mathematics entries (UK)



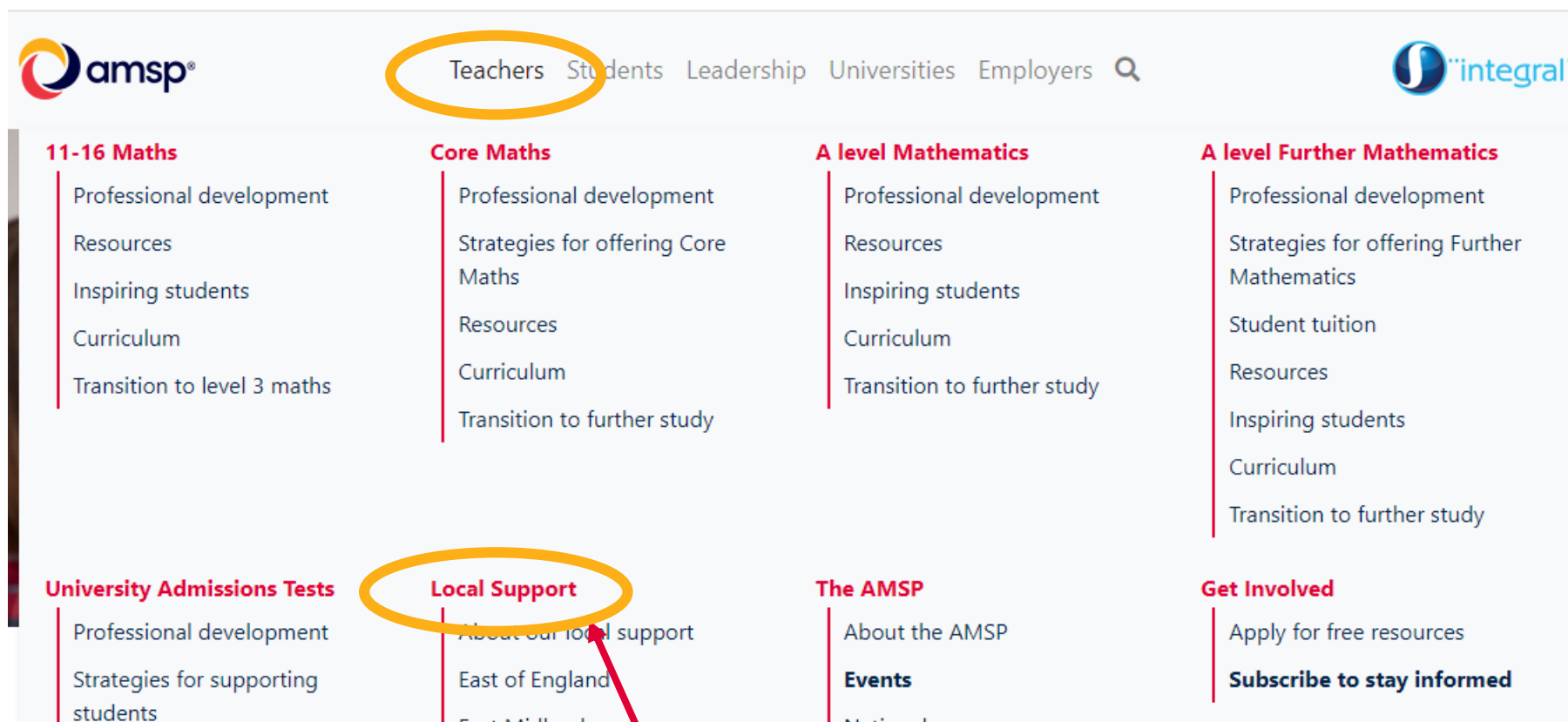
A and AS level Further Mathematics entries (UK)



A and AS level Mathematics entries (UK)



amsp.org.uk



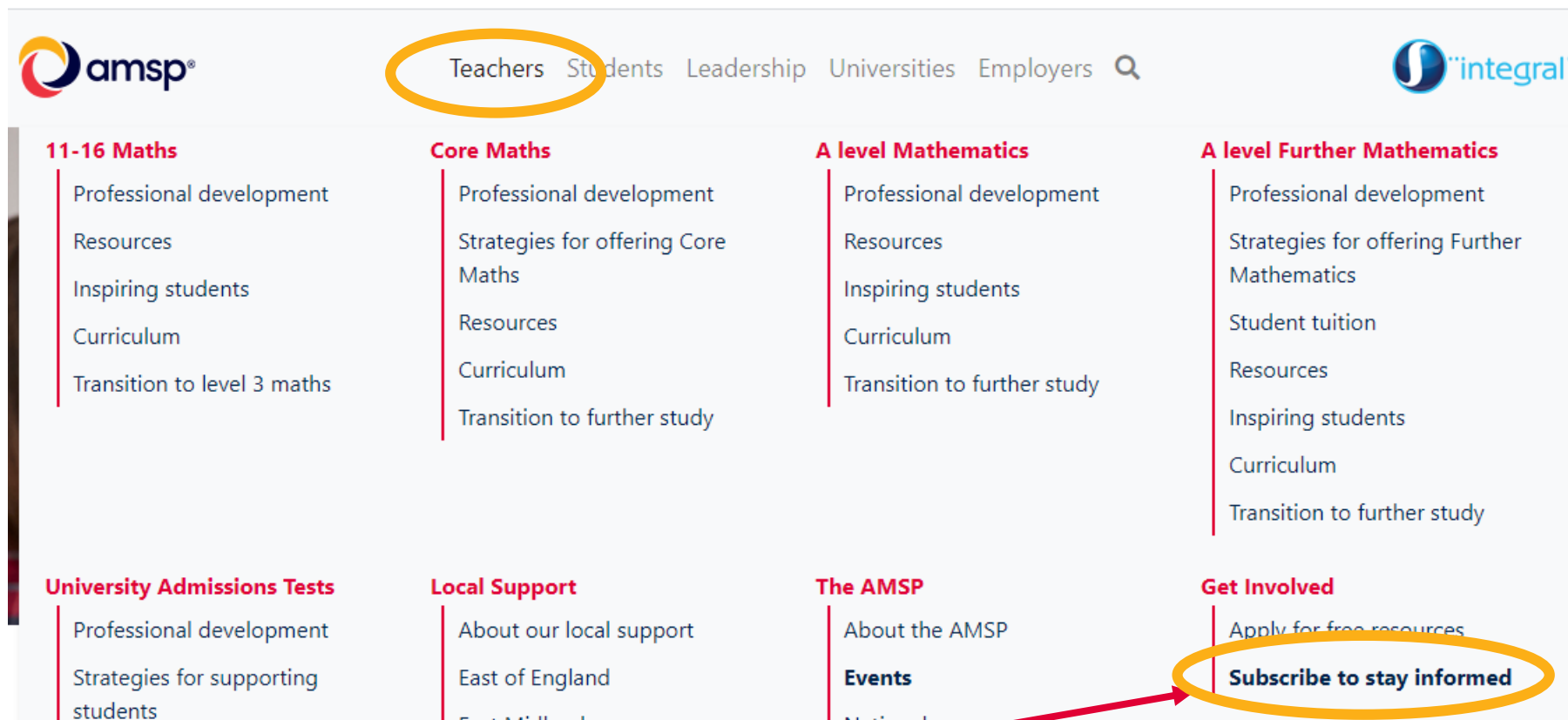
The screenshot shows the amsp.org.uk website. At the top left is the amsp logo. To its right is a navigation bar with links: Teachers (circled in yellow), Students, Leadership, Universities, and Employers, followed by a search icon. At the top right is the MEI logo with the text 'Managed by MEI Mathematics Education Innovation'. Below the navigation bar is a grid of eight content sections. The first row contains: '11-16 Maths', 'Core Maths', 'A level Mathematics', and 'A level Further Mathematics'. The second row contains: 'University Admissions Tests', 'Local Support' (circled in yellow with a red arrow pointing to a text box below), 'The AMSP', and 'Get Involved'. Each section lists various resources and links.

11-16 Maths	Core Maths	A level Mathematics	A level Further Mathematics
Professional development	Professional development	Professional development	Professional development
Resources	Strategies for offering Core Maths	Resources	Strategies for offering Further Mathematics
Inspiring students	Resources	Inspiring students	Student tuition
Curriculum	Curriculum	Curriculum	Resources
Transition to level 3 maths	Transition to further study	Transition to further study	Inspiring students

University Admissions Tests	Local Support	The AMSP	Get Involved
Professional development	About our local support	About the AMSP	Apply for free resources
Strategies for supporting students	East of England	Events	Subscribe to stay informed
	East Midlands	National events	

Click on your region under 'Local support' for contact details of your Area Coordinator

amsp.org.uk



The screenshot shows the amsp.org.uk website. The 'Teachers' link in the top navigation bar is circled in yellow. A red arrow points from the 'Subscribe to stay informed' link in the 'Get Involved' section to a text box at the bottom of the slide. This link is also circled in yellow.

11-16 Maths	Core Maths	A level Mathematics	A level Further Mathematics
<ul style="list-style-type: none">Professional developmentResourcesInspiring studentsCurriculumTransition to level 3 maths	<ul style="list-style-type: none">Professional developmentStrategies for offering Core MathsResourcesCurriculumTransition to further study	<ul style="list-style-type: none">Professional developmentResourcesInspiring studentsCurriculumTransition to further study	<ul style="list-style-type: none">Professional developmentStrategies for offering Further MathematicsStudent tuitionResourcesInspiring studentsCurriculumTransition to further study

University Admissions Tests	Local Support	The AMSP	Get Involved
<ul style="list-style-type: none">Professional developmentStrategies for supporting students	<ul style="list-style-type: none">About our local supportEast of EnglandEast Midlands	<ul style="list-style-type: none">About the AMSPEventsNational events	<ul style="list-style-type: none">Apply for free resourcesSubscribe to stay informed

Sign up to our **Stay Informed list** to receive regular communications from the AMSP



Closing thoughts

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FM videos

Free to teachers and students in all AMSP registered schools.


Use in the classroom or for independent study.

For more information and an **A4 poster** go to:

amsp.org.uk/teachers/a-level-further/resources

Short video introductions to AS/A level Further Mathematics topics



- 4-5 videos for each topic
- Each video is only 5-10 minutes long
- Easy access through  "integral"
- Videos for AQA, Edexcel, OCR and MEI

Use them to:

- Catch up
- Keep up
- Get ahead

FM videos

- Tailored to each awarding organisation
- Students at any registered school/college can access the videos via a school password
- For those with Integral accounts, these videos are embedded in relevant sections
- MEI 'Further Pure with Technology' is now included



[↑ Back to 'MEI Further Mathematics videos'](#)

MEI Year 1 (AS) Core Pure

Matrices 1: Introduction and matrix multiplication

- | | |
|---|--------------------------|
|  1.1 Basic operations with matrices | <input type="checkbox"/> |
|  1.2 Multiplying matrices | <input type="checkbox"/> |
|  1.3 Properties of matrix multiplication | <input type="checkbox"/> |
|  1.4 Using zero and identity matrices | <input type="checkbox"/> |

Matrices 2: Transformations and invariance

- | | |
|---|--------------------------|
|  2.1 Reflections in 2-D | <input type="checkbox"/> |
|  2.2 Rotations in 2-D | <input type="checkbox"/> |
|  2.3 Stretches, enlargements & shears in 2-D | <input type="checkbox"/> |
|  2.4 Successive transformations in 2-D | <input type="checkbox"/> |
|  2.5 Transformations in 3-D | <input type="checkbox"/> |
|  2.6 Invariant lines and points | <input type="checkbox"/> |
-

Matrices and transformations 3: Invariance

Before you start...

- You need to be confident with the work in the previous two sections.

Learn

- | | | |
|--|--|--------------------------|
|  | Walkthrough: Invariant points | <input type="checkbox"/> |
|  | Notes and examples | <input type="checkbox"/> |
|  | FM video 2.6: Invariant lines and points | <input type="checkbox"/> |

Develop

- | | | |
|---|----------------------------|--------------------------|
|  | Exercise level 1 | <input type="checkbox"/> |
|  | Exercise level 1 solutions | |

Progress

- | | | |
|---|----------------------------|--------------------------|
|  | Crucial points | <input type="checkbox"/> |
|  | Exercise level 2 | <input type="checkbox"/> |
|  | Exercise level 2 solutions | |
|  | Test M3 | <input type="checkbox"/> |

Video+ accounts

- Individual student accounts with access to all FM resources and videos
- Access for you to the teacher management system so you can monitor progress
- £30 per student per academic year
- Only advised for small cohorts (otherwise a school Integral account is better value)
- More information:

<https://amsp.org.uk/teachers/a-level-further/resources>

Reflection

- Do you currently make use of the FM videos, and if so how?
- We suggest that they can be used to ‘Catch up/Keep up/Get ahead’. Do you think that these are suitable as a means of introducing a topic (‘flipped learning’)?
- What do you think are the pros and cons of students using short videos as part of their learning?

Sustained PD Courses

Are you teaching something new next year?

Do you have a colleague who needs in-depth training?

AMSP sustained PD courses blend online learning with face-to-face study days and the use of dedicated resources.

- Teaching A level Mathematics TAM
- Teaching Further Mathematics TFM1 & TFM2
- Teaching Mechanics TM1 & TM2
- Teaching Statistics TS1 & TS2
- Teaching Discrete Mathematics TD1 & TD2

amsp.org.uk/events/sustained-pd-courses

About the AMSP

- A government-funded initiative, managed by MEI, providing national support for teachers and students in all state-funded schools and colleges in England.
- It aims to increase participation in AS/A level Mathematics and Further Mathematics, and Core Maths, and improve the teaching of these qualifications.
- Additional support is given to those in priority areas to boost social mobility so that, whatever their gender, background or location, students can choose their best maths pathway post-16, and have access to high quality maths teaching.

Contact the AMSP



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amsp.org.uk



Advanced_Maths