GCSE
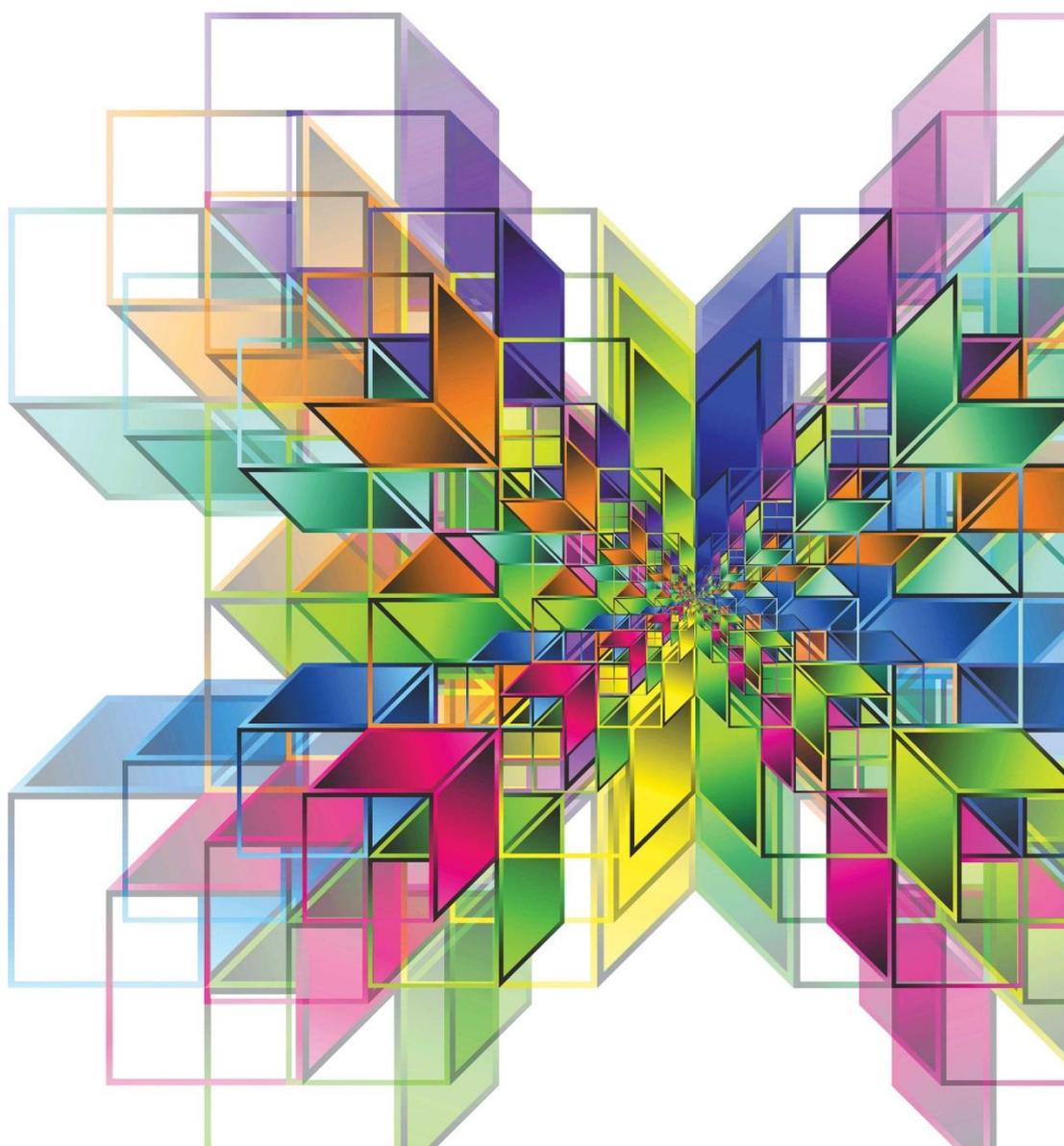# Mathematics

Higher tier

Insights from the first series, summer 2017

Published: September 2017

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Grade boundaries

Subject or paper	Max mark	Summer 2017 grade boundaries (raw mark)								
		1	2	3	4	5	6	7	8	9
Mathematics 8300H (higher)	240	-	-	33	46	72	98	125	157	189

How to interpret grade boundaries

GCSE Mathematics is a reformed qualification. This means you don't need to convert your marks to the uniform mark scale (UMS). A final grade is based on total marks from all papers.

How grade boundaries are set: the 'statistical' element

Our Centre for Education Research and Compliance (CERP) use a range of statistics to make predictions that suggest the most appropriate grade boundaries. The statistical evidence considers the prior attainment of the given cohort as well as the distribution of marks.

How grade boundaries are set: the 'judgemental' element

Senior examiners review a script sample to confirm that the statistically recommended marks are suitable for the grade.

Grade boundary setting is overseen by the qualifications regulator.

To find more grade boundaries and learn how they are set, visit aqa.org.uk/gradeboundaries

Qualification summary

All three papers should be of the same demand so it was pleasing to see consistent performance across the papers. The means for papers 1,2 and 3 were 47%, 49% and 47% respectively.

Paper 1 was generally accessible, but longer questions showed examples of disorganised working.

Most students completed Paper 2 in the time allowed, but we found a significant number of poorly presented solutions in some problem solving questions.

On Paper 3, very few questions had a significant number of non-attempts, but some new topics and questions with elements of novelty were generally not well answered.

Overall, exam response data from summer 2017 show that question demand slowly ramped up throughout each of the three papers, meaning the most accessible marks weren't buried late in the papers. This is important for avoiding a confidence crash in students who hit difficulties.

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Paper 1 (Higher)

This is a snapshot. Learn more about every question from the summer 2017 series in the Chief Examiner's reports. Visit allaboutmaths.org.uk, log in and follow:

Teaching Resources > Reports on the Examination > GCSE Maths Reports > June 2017 GCSE Examiner Reports.

Most successful topics	Least successful topics
• Laws of indices • Congruence • Density • Simultaneous equations • Area of a circle in terms of pi	• Geometric progression • Writing a conversion formula • Inequalities • Converting fractions to recurring decimals • Writing a cube root as a power in a different base number • Solving a problem involving fractions and proportions • Equation of a tangent

Highlights from summer 2017

Questions 6, 18, and 26
These three questions were good differentiators.

In question 6, the first and last statements were usually correct.

The most successful students listed the various ways to combine the offers in question 18, for example 3 from A and 5 from B, and were then able to work out the cost of each.

Most students correctly expanded two brackets in question 26, but many then failed to correctly multiply the result by the third bracket. Some students correctly multiplied $(x - 4)$ by $(2x + 3y)$, but then squared the result. Another common error was to say that $(2x + 3y)^2$ was $(4x^2 + 9y^2)$.

Questions 28 and 29
Most students responded to at least part of each of these questions correctly.

In question 28, most correctly worked out the volume of the large cone. From there, common errors included taking the height of the small cone as 9 cm or giving its radius as 3 or 2.5 cm.

In question 29, most students used at least one correct trigonometric value, but many did not process these into the required form.

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Paper 2 (Higher)

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Teaching Resources > Reports on the Examination > GCSE Maths Reports > June 2017 GCSE Examiner Reports.

Most successful topics	Least successful topics
- Trigonometry in a right-angled triangle - Drawing a distance-time graph - Writing numbers, given in different formats, in descending order - Working out the median from a box plot - Working with a Venn diagram	- Conversion of square millimetres to square centimetres - Product rule for counting - Identifying the diameter of a circle using a circle theorem - Working out a formula from a graph - Interpreting a histogram - Working out an inverse function

Highlights from summer 2017

Question 12
This question was not well answered with more students choosing BE than the correct answer, AD.

Question 13
Question 13 was a great differentiator. Many satisfied the conditions of this problem solving question, but some made arithmetic errors working out the final total amount.

Other students didn't arrive at the correct number of bread rolls and cheese slices, but satisfied the requirement to have exactly twice as many cheese slices as bread rolls. The most common error was to work with 105 bread rolls (7 packs) and 200 cheese slices (10 packs).

Question 15
This tested one of the new assessment objectives in part (a). It generated some very good explanations but many didn't identify the error made. Common incorrect responses included:
- that Sami should have square rooted 100 before dividing by 2
- that the error was a failure to convert the final answer to a decimal.

Questions 22, 23 and 24
Fully correct responses were rare and question 24 was the most challenging on the paper for many students.

In question 24, a lot of students could work out the frequencies but very few could use them to deduce the quartiles. Those who could work out one usually found the lower quartile, but often 45 (rather than 48) was divided by 4.

Paper 3 (Higher)

This is a snapshot. Learn more about every question from the summer 2017 series in the Chief Examiner's reports. Visit allaboutmaths.org.uk, log in and follow:

Teaching Resources > Reports on the Examination > GCSE Maths Reports > June 2017 GCSE Examiner Reports.

Most successful topics	Least successful topics
- Column vector addition - Relative frequency - Error intervals - Expectation	- Ratio problem - Index notation - Quadratic sequence - Turning point problem - Interpreting speed from a distance-time graph - Area problem using algebraic expressions for lengths - Proof

Highlights from summer 2017

Question 9
The highest proportion of fully correct answers came in part (a). Almost all students worked out at least one correct calculation, but a common error was to change 2/3 to 0.6.

Question 11
Almost all students attempted question 11, but we saw frequent errors stemming from the problem-solving nature of the question.

Question 17
The multi-step nature of question 17 also made it challenging for the majority. There were many correct responses, but frequent errors included mixed up units and time conversions (1.36 hours for 1 hour 36 minutes), and arithmetic errors in 'build up methods'. This suggests a number of students were not using a calculator.
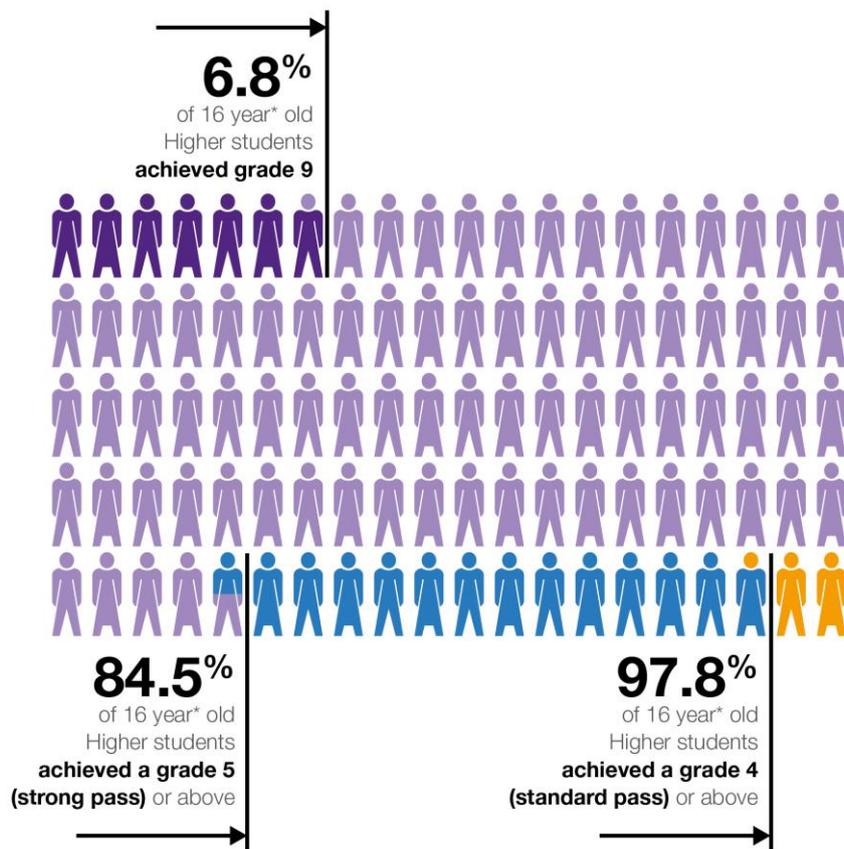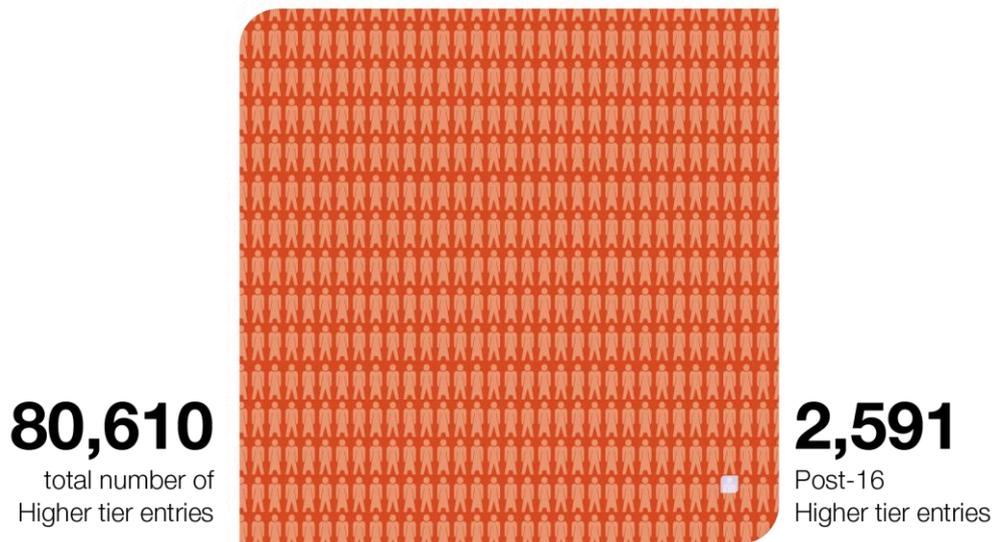
Question 27
Question 27 proved too challenging for almost all students. Few students:
- attempted to complete the square
- attempted to use the quadratic formula
- made progress beyond stating that x^2 is always positive
- used a graphical approach.

Common errors included using an odd/even approach, or trying to factorise the expression.

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Higher tier analysis

Conduct your own analysis based on item level data relevant to you. Use Enhanced Results Analysis (ERA) from aqa.org.uk/e-aqa

80,610
total number of
Higher tier entries

2,591
Post-16
Higher tier entries

6.8%
of 16 year* old
Higher students
achieved grade 9

84.5%
of 16 year* old
Higher students
**achieved a grade 5
(strong pass) or above**

97.8%
of 16 year* old
Higher students
**achieved a grade 4
(standard pass) or above**

*16 year old refers to students who turned 16 on or before 31 August 2017

Higher tier analysis cont.

Conduct your own analysis based on item level data relevant to you. Use Enhanced Results Analysis (ERA) from aqa.org.uk/e-aqa
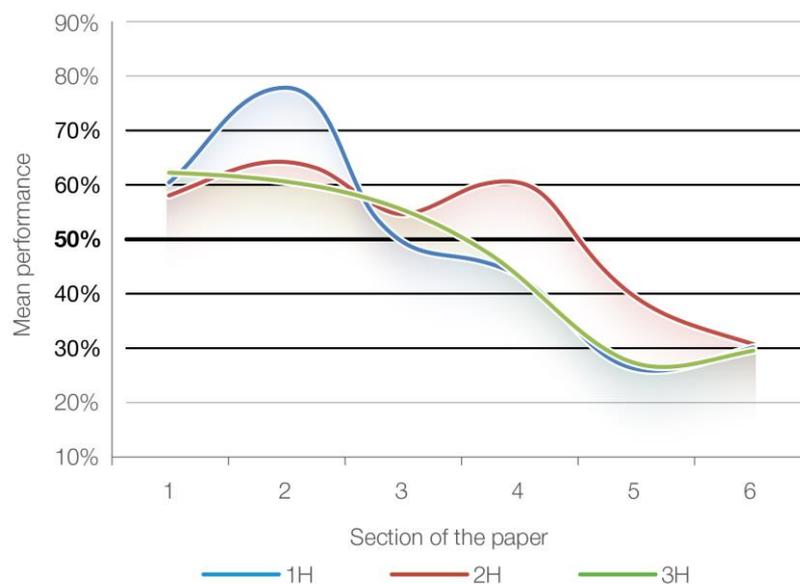
Higher tier attainment overall

We looked at the mean mark as a percentage of the total for each four-page section of each paper. We also considered the mean mark as a percentage of the total for 'medium', 'medium/ high' and 'high' demand questions as judged by our writing team.
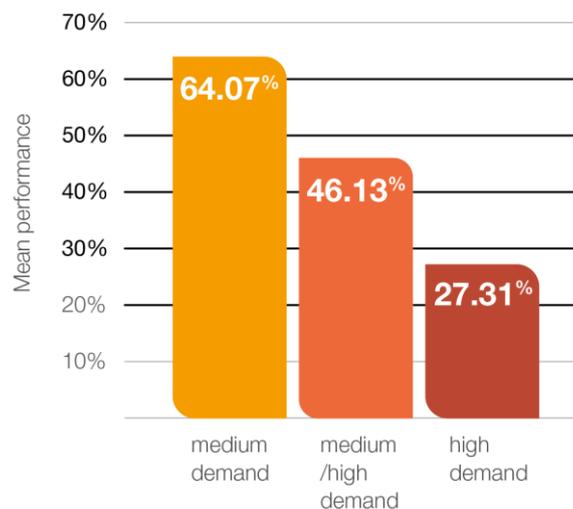
We did this for every paper and overall.

This graph shows how performance decreased as demand slowly increased as students progressed through the papers.

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Notes

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