AQA
Realising potential

GCSE MATHEMATICS

All tiers and papers

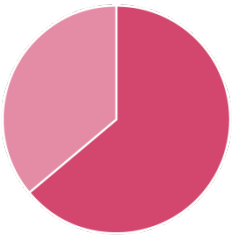
Insight report: 2018 results at a glance

Published: October 2018

Foundation tier analysis

Conduct your own analysis using data relevant to you. Watch short tutorials on using Enhanced Results Analysis (ERA) for school, subject, group or student performance; or log straight in through aqa.org.uk/log-in

Outcomes by age: Foundation

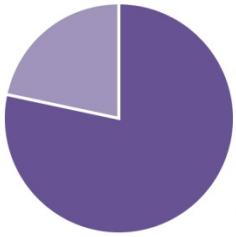


		5	4	3	2	1
16 and under	% (cum)	9.7	36.9	63.0	83.2	96.5
17 and above	% (cum)	3.5	20.5	56.8	84.4	97.0

AQA GCSE Mathematics

45% of Foundation tier students were aged 17 or older. Their results profile is very different from that of 16 year olds.

Outcomes by age: Overall



		9	8	7	6	5	4	3	2	1
16 and under	% (cum)	3.5	10.1	19.7	32.3	50.1	70.3	83.0	92.2	98.2
17 and above	% (cum)	0.1	0.4	1.0	2.1	6.8	24.4	59.1	84.7	96.4

AQA GCSE Mathematics

Across the whole qualification, 28% of entries were aged 17 and above.

As expected, their results are very different from the 16 year old majority. Note: this is an overall picture.

Watch tutorials on using ERA for results analysis, or log straight in via e-AQA.

Foundation tier analysis cont.

Conduct your own analysis using data relevant to you. Watch short tutorials on using Enhanced Results Analysis (ERA) for school, subject, group or student performance; or log straight in through aqa.org.uk/log-in

Total entries by age and tier.

Total awards by age and tier

16- = Age 16 and under

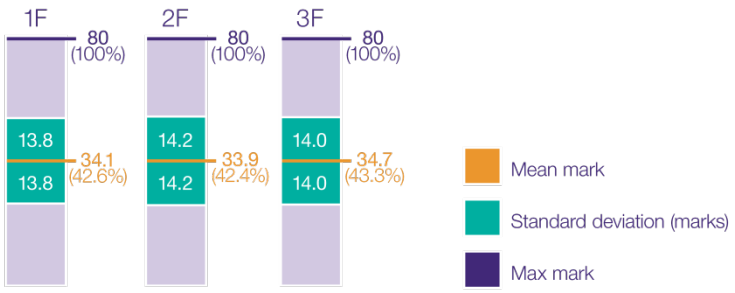
17+ = Age 17 and over

	16-	17+	Total
Foundation	68,969	51,008	119,977
Higher	84,738	5,150	89,888
Total	153,707	56,158	209,865

AQA GCSE Mathematics

Mean raw mark and standard deviation by paper.

Mean and standard deviation by paper: Foundation



AQA GCSE Mathematics

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Grade boundaries

Subject or paper	Max mark	Summer 2018 grade boundaries (raw mark)								
		9	8	7	6	5	4	3	2	1
Mathematics 8300F (Foundation)	240	-	-	-	-	161	125	92	59	27

Performance and notional boundary marks for individual papers were very consistent once again. In fact, the range of mean marks for the three papers was less than a single mark.

Grade boundaries are set using a mix of statistics and expert judgement

Our Centre for Education Research and Practice (CERP) uses 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. Senior examiners then review a script sample to confirm the statistically recommended marks are sensible for the grade.

Boundary setting is overseen by Ofqual. To find more grade boundaries and learn how they are set, visit aqa.org.uk/exams-administration/results-days/grade-boundaries-and-ums

Qualification summary

The biggest change in GCSE maths this year was in the entry profile. The reformed (9-1) GCSE are now the only maths GCSEs available to post-16 students, and the overwhelming majority of these older students sit the Foundation tier. This has a significant effect on the size of the entry and the results profile as shown in the analysis on page 4. For 16 year olds, there was a small drop in Foundation tier entries with a rise at the Higher tier. This shift is likely to mean that there were fewer high attaining Foundation tier students this year. This is backed up by the distribution of marks with only 0.3% of this year's foundation tier entry scoring more than 200/240.

Paper 1, Foundation

This is a snapshot. Learn more about every question from the summer 2018 series in the Chief Examiner's reports. Visit allaboutmaths.aqa.org.uk, log in and follow:

Home > GCSE Maths (8300) > June 2018 GCSE Examiner reports.

Most successful topics for students	Least successful topics for students
• working out a percentage of an amount • working out the mean and median • discussing the effect of an assumption being incorrect • relative frequency • working with negative numbers • similar shape recognition.	• problem solving in a ratio context • decimal calculations • arithmetic within order of operations • three-dimensional object problem solving • writing an improper fraction from information in simplest form • range of fractional and negative numbers • standard form.

Highlights from summer 2018

Very few questions were left blank

Overall, there were very few questions with a high rate of non-attempts. This indicates an accessible paper with no evidence of time constraints. Many attempts at the problem solving questions were more detailed and better laid out than in the summer series of 2017.

Question 1

Of the first four multiple choice questions, three were well answered. Question 1, surprisingly, wasn't. Fewer than 40% responded correctly, with $\frac{5}{10}$ being the most popular incorrect answer.

Question 11

Most students made a good attempt at this problem solving question (6 marks). They worked out that six coaches were needed and the subsequent cost to passengers. Some missed out the pay for the drivers but the main source of error was dealing with the units when working out the cost of the fuel. Pence were sometimes counted as pounds leading to some incredibly high profit values and students often did not question whether the answers were realistic. Some provided almost perfect solutions but did not multiply the fuel cost by 6.

Reports on the exam are written by senior examiners who see more responses than anyone else. Access full reports in allaboutmaths.org.uk

Paper 2, Foundation

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Home > GCSE Maths (8300) > June 2018 GCSE Examiner reports.

Most successful topics for students	Least successful topics for students
• calculation • completing a pictogram • number puzzle • conversion of minutes • describing correlation • expanding brackets.	• writing and using expressions • using a formula • drawing a graph • evaluating a method • bearings • combining probabilities • error intervals.

Highlights from summer 2018

Question 8

This problem-solving question proved accessible and was very well answered.

Question 14

Part (a) was very well answered, although students often went on to round their value. In part (b), students commonly rounded the answer to part (a) to one significant figure. A sizeable minority stated that their answer to part (a) was not sensible because it had too many decimal places. Those who used correct approximations for the original values usually completed this part successfully.

Question 28

This question was very poorly answered. Most students didn't use bounds for their error intervals. The few who understood what was needed in part (a) often used 41.5 and 42.5 in part (b). A significant minority didn't know the number of sides of a pentagon. Many did not attempt this question.

Paper 3, Foundation

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Most successful topics for students	Least successful topics for students
• fraction and percentage of an amount • algebraic vocabulary • probability and systematic listing • proportion calculation from scale drawing • number problem solving with multiples • constructing a triangle • Fibonacci style sequence problem solving • interpreting a Venn diagram • similar shapes.	• description of capacity involving a non-uniform geometric shape • proportion problem solving from information on a frequency tree • profit and loss money calculation • area of a triangle • average speed from distance travelled in minutes • drawing a pie chart and interpreting proportions with a pie chart • HCF and LCM problem solving • compound interest • parallel lines and coordinates on a line • reverse percentages • sequence problem solving with primes • vectors.

Highlights from summer 2018

Decisions on calculator use

Generally, arithmetic errors caused problems for some students who engaged with a question but decided not to use a calculator. Some students didn't use/show the working from their calculator.

Question 14

This question was well answered by the majority. However, many students used an incomplete method – multiplying the base by the height and then omitting to divide by two.

Question 22

Part (a) was well answered by the majority. A common error was for students to omit brackets when keying the calculation into their calculator leading to, for example, 10 + 6 ÷ 2 = 13 for the 4th term. Some students made errors with mental arithmetic. Another common error was to simply halve only the previous term leading to, for example, 3, 1.5, and 0.75 as terms 4, 5 and 6.
Part (b) was reasonably well answered and proved a good discriminator. Common incorrect answers were 19, 9.5, 5.5 and 11 from incomplete or confused methods involving either doubling or halving. 15 was often part of the working but not as the final answer given.

Higher tier analysis

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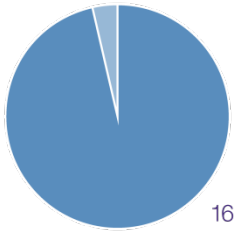
Outcomes by age: Higher

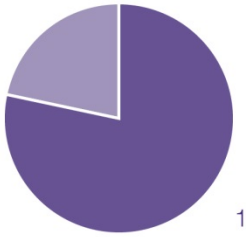


		9	8	7	6	5	4	3
16 and under	% (cum)	6.5	18.4	36.1	59.1	83.7	98.0	99.6
17 and above	% (cum)	1.8	5.7	14.4	29.8	49.9	76.1	89.2

AQA GCSE Mathematics

In contrast to the Foundation tier, older students make only 6% of the Higher tier cohort.

Outcomes by age: Overall



		9	8	7	6	5	4	3	2	1
16 and under	% (cum)	3.5	10.1	19.7	32.3	50.1	70.3	83.0	92.2	98.2
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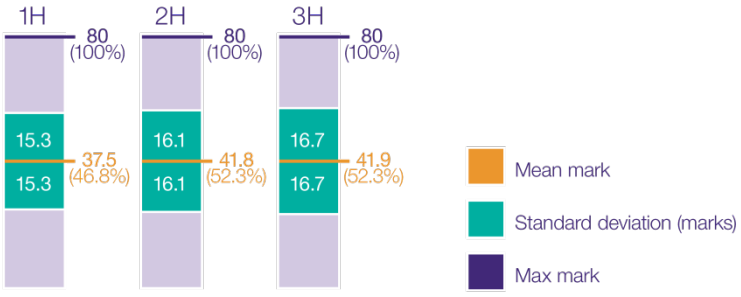
AQA GCSE Mathematics

Mean and standard deviation by paper: Higher



Mean raw mark and standard deviation by paper (all tiers).

AQA GCSE Mathematics

Watch tutorials on using ERA for results analysis, or log straight in via e-AQA.

Grade boundaries

Subject or paper	Max mark	Summer 2018 grade boundaries (raw mark)								
		9	8	7	6	5	4	3	2	1
Mathematics 8300H (Higher)	240	201	169	138	107	77	47	32	-	-

How to interpret grade boundaries

As expected in this second year of the new GCSE, grade boundaries have gone up, particularly at the upper end of the range. The so called 'saw tooth' effect is expanded upon in this Ofqual blog.

Grade boundaries are set using a mix of statistics and expert judgement

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Qualification summary

The entry for the Higher tier rose this year for two reasons. The overall AQA entry for GCSE maths has grown and there was a 2% shift of 16 year old students from Foundation to Higher. Results suggest this was a positive change: there was no increase in students failing to achieve a grade in the higher tier and an overall slight increase in grade 6 (the lowest non-common grade).

Feedback on the exam courses use student responses to explore what happened in each exam series. Visit aqa.org.uk/maths-cpd

Paper 1, Higher

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Home > GCSE Maths (8300) > June 2018 GCSE Examiner reports.

Most successful topics for students	Least successful topics for students
• Solving an inequality • Relative frequency • Expectation • Solving a coordinate problem.	• Surface area • Ratio • Completing the square • Simplifying surds • The equation of a transformed curve.

Highlights from summer 2018

Question 7

The vast majority of students found the x and y 'steps' from A to B, repeated them to C and D, and were generally successful. Errors usually came from those trying more complicated methods, often involving Pythagoras' Theorem.

Question 21

Performance on this topic slightly improved against previous series, although only a minority of students gave a fully correct answer. A common error was to maintain the orientation of the given triangle.

Question 30

Half of students knew at least one of the values, with sin 30° the most common. Many knew all three values, but then multiplied them all rather than multiplying and adding. Several students who obtained $\frac{3}{2} + \frac{1}{2}$ worked this out as $\frac{4}{4} = 1$

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Paper 2, Higher

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Most successful topics for students	Least successful topics for students
• identifying a number written in standard form • matching sequences to descriptions • error interval • problem involving a hemisphere • completing a tree diagram • scale drawing and loci • density.	• giving a reason for a better estimate • showing simplification of an algebraic fraction • similar shapes problem • probability using a Venn diagram • showing intersection of a curve and a line • functions.

Highlights from summer 2018

General comments

Presentation of work was often good but many students did not show sufficient working in questions that required them to show that something was true. Similarly the proof question was often missing important steps. Some students were not able to recall relevant formulae that were needed to answer some questions.

Question 16

Part (a) was well answered. Nearly all students who recalled the correct relationship between density, mass and volume gave the correct solution. Part (b) was not as well answered and was a good discriminator. The main error was not knowing the formula for the volume of a cylinder. Some omitted π and others used $\frac{1}{3}\pi r^2 h$

Question 27

There were many very good presentations of this proof but also many instances of solutions that lacked rigour. Steps were often missing and some didn't attempt to use algebra at all. The question was a good discriminator.

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Paper 3, Higher

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Most successful topics for students	Least successful topics for students
• use of decimals • inequalities • exterior angles of a decagon • column vectors • expressions • interpretation of a speed-time graph.	• showing that two lines are parallel • determining whether a point is above, below or on a given line • properties of a rhombus • use of Pythagoras' Theorem in an algebraic context • trigonometry in three dimensions • interpreting a histogram • equation of a tangent to a circle.

Highlights from summer 2018

Question 14

This question was quite well answered with a majority giving a fully correct graph. Of the other students most plotted at least six correct points. Fewer students appeared to join their points with straight lines than in the previous series.

Question 18

This question proved challenging. Many obtained a common denominator for their fractions of $6x^2$ but didn't simplify correctly. It was also very common to see $x + 4 - 5 = x - 1$ for the numerator and $3x - 2x = x$ for the denominator.

Question 26

On part (a) of this question students generally either gave a fully correct method and answer or made no progress. The most successful students counted centimetre squares and compared this with the total numbers of cars. A common incorrect method was to divide 480 by the total class width and then multiply by the class width of the first bar (giving $480 \div 35 \times 15 = 205.7$ cars). In part (b) whilst there were a significant number of correct answers, many did not read the scale correctly, assuming the bar was one centimetre high.

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Notes

Notes

Notes

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