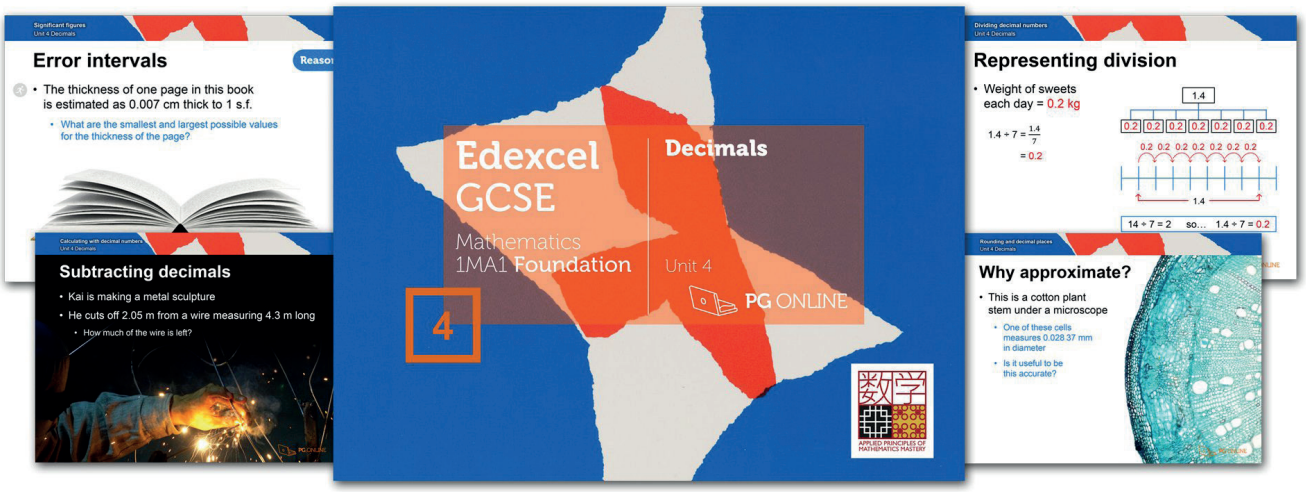
Summary of the Examiner's Report 2018

Edexcel GCSE Mathematics 1MA1

PG ONLINE

The following gives an overview of some of the key points and areas for students to improve on for the examination based on feedback from the 2018 examination series. This is not a replacement for the full examiner's reports which are still recommended for teachers to read.



One of our free editable teaching units for Edexcel GCSE Mathematics 1MA1

Improve results

Grade boundaries – June 2018

1MA1			9	8	7	6	5	4	3	2	1
1F	Foundation tier	Paper 1F					58	47	35	23	11
2F	Foundation tier	Paper 2F					57	46	34	22	10
3F	Foundation tier	Paper 3F					54	43	32	21	10
1H	Higher tier	Paper 1H	69	58	48	38	28	18			
2H	Higher tier	Paper 2H	68	57	47	37	27	18			
3H	Higher tier	Paper 3H	65	55	44	34	24	14			

Save hours of planning

Marks for all papers are out of 80

1MA1 Overall		9	8	7	6	5	4	3	2	1
1MA1F	Foundation tier					169	136	101	66	31
1MA1H	Higher tier	202	170	139	109	79	50	35		

Key information for all papers

Marks available	80
Time allowed	1h 30m
Resources *	Black ink / ball-point pen, HB pencil, ruler, protractor, compasses, tracing paper
Question choice	Answer all questions

* A scientific calculator is also permitted for papers: 1MA1/2F and 3F, 2H and 3H: Foundation papers 2 & 3 and Higher papers 2 & 3

Note: This summary is the interpretation of PG Online and has not been through any accreditation process by the examination board
Source: Pearson Examiners' report Summer 2018 Pearson Edexcel GCSE (9-1) Mathematics 1MA1

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General comments on required student improvements from the Chief Examiner's report on Summer 2018 Edexcel GCSE 9 - 1 Mathematics (1MA1)

1. Concerns were raised that a minority of students lost marks because they either did not have a calculator on the calculator papers or failed to use them correctly.
2. The above concern extended to the use of protractors and compasses. Students should be able to use mathematical instruments allowed on the papers correctly.
3. Showing working out is an issue for some students. They should know that questions stating (the following for example) are not awarded full marks, even if the answer is correct.
   - "You must show all your working"
   - "Give reasons for your answer"
   - "Prove"
4. The previous point is particularly relevant on calculator papers. Students must not do the whole calculation on their calculators, and just write down their answer. Even the most basic of calculations must be shown.
5. Students writing down multiple methods is common. Candidates should be reminded that examiners are instructed to award 0 marks for workings that are ambiguous, or where it is not clear which method leads to the answer given. Students should be reminded that, if they change their minds on a method, they should cross out the previous working (rather than scribble over, rub it out or render illegible in some other way) and show the intended method clearly.
6. There has been an overall decline in the standard of presentation. Written communication is often poor. Highlights include:
   - Illegible handwriting leading to examiners being unable to award marks because they can't decipher the answers given.
   - Some students write answers in a foreign language and therefore work cannot be marked - all answers are expected to be in English.
   - 4 and 9 are more commonly written ambiguously, also 1 and 7.
   - Over-writing to correct mistakes is becoming more common. Students are reminded again to cross out and re-write their answers.

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Observations on the Assessment Objectives:

Number (Foundation and Higher tier):

1. Students' responses to some questions are littered with arithmetical errors, mainly in calculations requiring division.
2. Even on the calculator papers some students use incorrect non-calculator methods, indicating they had no calculator (or were unable to use one).
3. Rounding to a given number of significant figures poses problems for some students.
4. While there is evidence of a better understanding of how to manipulate fractions than in previous years, students still struggle with the concept of dividing fractions.
5. Money problems are tackled well, but questions involving other units, or a change of unit are poorly attempted.
6. Students should be better prepared in the understanding of union or intersection, and their association with a Venn diagram.
7. Many misunderstandings relating to time were noticed particularly with respect to using a timetable and planning a journey.
8. Students do not recognise that an instruction to estimate an answer should trigger them to apply rounding. Any attempt to apply a complex calculation results in zero marks being awarded. Note that any attempt to round will gain some marks, not necessarily just to 1 significant figure.

Higher tier only:

9. Calculating with standard form remains a weakness amongst Higher level students. Those who know how to perform calculations in standard form on a calculator are generally more successful.
10. Candidates can work out upper and lower bounds, but have difficulty choosing which bound to use in a given calculation.

Probability and Statistics (Foundation and Higher tier):

1. This year, interpretation of a composite bar chart was tested, and students demonstrated significant weakness in interpreting it.
2. There is still evidence that protractors are being used inaccurately, or that students do not have a protractor, when drawing / interpreting pie charts.
3. While there is an improvement in writing criticism on statistical diagrams, students often write conflicting remarks, or comments that were too vague.

Higher tier only:

4. Much work is needed on the use of histograms.
5. Unstructured problems in probability require much more practice.

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Algebra (Foundation and Higher tier):

1. When negatives are involved, in general students' performance is weaker. For example, drawing a graph of $y = 1 - 4x$, or in calculating the values for a quadratic where the x values are negative. Students should be more practised in using the symmetrical properties of a parabola to check their curve.
2. Rearranging formulae remains a weakness of many Foundation students and should be practised much more.
3. There seems to be little understanding of the relationships between equations and their graphs, for e.g. using the values of m and c on parallel graphs, when finding an equation of a straight line.
4. Methods of solving equations vary, but those who use the 'equation balancing' method tend to achieve more marks. Candidates should be reminded that it is rare to achieve full marks using trial and improvement methods and this method should be avoided. Also, teachers should note that many instances of the use of flow diagrams led to incorrect order of operations and should also be discouraged.

Higher tier only:

5. Performance in expanding brackets and interpreting inequalities is hindered when negatives are used.
6. Candidates have trouble using drawn graphs to find solutions of equations. There are many errors due to the inaccuracies of the drawn graphs. Students should take greater care in plotting and drawing graphs, particularly when they are going to be used for further work.
7. The graph of a circle $x^2 + y^2 = r^2$ is frequently shown to be unfamiliar to students.
8. Substitution into basic formulae is done well, but more work is needed to prepare students for applying this to functions and composite functions.
9. Factorising trinomials remains a weakness, as does rearranging more complex expressions such as those involving fractions.
10. Multiplying brackets where there is a negative sign proves challenging.
11. Problem-solving involving the derivation of algebraic expressions needs far more practice. This is especially true when algebra is used as a problem-solving tool, such as when angles are expressed algebraically in geometry problems.
12. Students should know that substituting a range of numbers does NOT constitute algebraic proof.
13. Finding an estimate of the speed from a distance / time graph (non-linear) proves to be challenging, perhaps because students failed to connect the fact that the tangent to the curve was needed.

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Ratio, Proportion and Rates of change (Foundation and Higher tier):

1. Many candidates attempt non-calculator methods for finding percentages on the calculator paper, leading to incorrect answers.
2. On the non-calculator paper, percentages are mostly attempted by building up to the required percentage, and often candidates have difficulty in piecing together the parts.
3. Students have great difficulty when attempting questions using linked ratios (e.g. Given $a : b$ and $b : c$, find $a : c$
4. There are some instances of students failing to simplify ratios, even when asked to do so.
5. Scale diagrams are a weakness for many candidates.
6. Compound measures, such as speed, density, pressure and any context involving proportional units are frequently misunderstood.

Higher tier only:

7. Percentage change and reverse percentages are still not well understood.
8. When using multipliers, particularly in compound interest questions, students must take care to choose the correct multiplier (for example 1.4% = 1.14 instead of 1.014)
9. In direct / inverse proportion questions, students use the wrong process, confusing the two.

Geometry and measures (Foundation and Higher tier):

1. Recall of essential formulae remains a weakness, particularly those for areas of a triangle and trapezium and those related to a circle.
2. The use of correct mathematical language, for example, in geometrical reasoning and in transformation geometry is commonly seen. Students must be reminded that non-technical language will not gain any marks.
3. The handling and conversion of units is commonly misunderstood by Foundation candidates. Students, at both Foundation and Higher level, need to be reminded that there is usually one question in which they must state their units.
4. Mensuration work on problem solving continues to be challenging for students. They often mis-read the question and therefore miss out essential parts of the process for gaining a complete solution.
5. Finding the sum of the interior angles of a polygon requires more work, as many students assume it is 360° regardless of the number of sides of the polygon.

Higher tier only:

6. The connection between the use of Pythagoras' Theorem and trigonometry in 2D and 3D is often not made. Candidates successful in solving 2D problems often have trouble solving those in 3D.
7. Diagrammatical representations of vectors need much more work generally, and centres need to focus on the full range of vector applications.
8. Similarities involving lengths, areas and volumes prove challenging.
9. Geometrical reasoning in the context of formal proofs remains very weak.