Glenmoor and Winton
ROA/Exam Revision
Mathematics

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Key Information

Mathematics - Year 8

Calculator Paper: 60 Minutes

Non-Calculator: 45 Minutes

Both exams will assess the knowledge students have obtained from the first term of study, as well as their general mathematical skills.

Key information

Students are advised to revise the following topics

Unit	Topic	Content	Sparx topics –
8.01	Powers and Roots	Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations	M135, M608
8.02	Prime Factorisation	Use the concepts and vocabulary of prime numbers, factors (or divisors), common factors, prime factorisation, including using product notation and the unique factorisation property (HCF and LCM with large numbers taught in 9.04)	M322, M823, M108, M365, M227, M698
8.03	Rounding	Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]	M111, M431, M994, M131, M878
8.04	Fractions	Multiply and divide fractions and mixed numbers	M939, M410, M671, M601, M835, M931, M157, M197, M110, M265
8.05	Solving equations 1	Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement). Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs	M707, M509, M387, M554, M813, M795, M531, M957
8.06	Angles in Parallel Lines	Understand and use the relationship between parallel lines and alternate and corresponding angles	M818, M163, M606, M351, M679, M393

Command Words

In a maths exam you may be asked to:

Command	What to do
Solve/Evaluate	Find the value of the variable in the question.
Calculate	This means that we need to work out the answer showing a method.
Complete	This usually means to fill in the gaps, often a data table or graph.
Explain	Tell the examiner how you got your answer or how you know it is correct.
Estimate	Don't work out exactly! Round the numbers to one significant figure first.
Give Reasons	Tell/Show how you got your answer
Simplify	This is the process of making something simpler/easier.
Expand	Multiply out the brackets
Factorise	This is the opposite of expanding; it means to find the factors and put brackets back in.
Construct	This is another way of saying draw accurately. (using a protractor etc)
Measure	Use a ruler or protractor to accurately measure lines or angles.
Sketch	An accurate drawing is not needed; freehand will do!
Hence	Use the information in the previous step to get to an answer
Prove	Use a formal mathematical argument to provide validity.
Evaluate	Calculate or simplify to find a numerical value.
Fully	Often 'simplify fully' or 'factorise fully' this means is has to be simplified as much as possible.

Key Formula - Highlighted

GCSE Higher Maths Formula Sheet

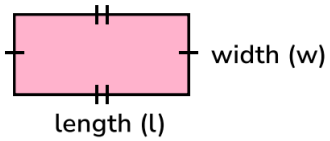
THIRD SPACE LEARNING

Higher

Area

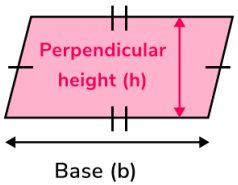
Rectangle

Area = length x width

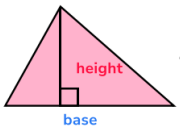


Parallelogram

Area = base x perpendicular height

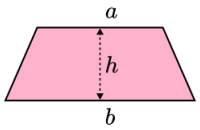


Triangle



Area = $\frac{1}{2}$ x base x height

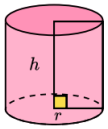
Trapezium



Area = $\frac{1}{2}(a+b)h$

Surface Area

Cylinder



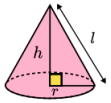
r = radius, h = height

Surface area = $2\pi rh + 2\pi r^2$

Cone

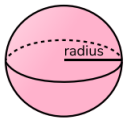
Curved surface area = πrl

Total surface area = $\pi rl + \pi r^2$



Sphere

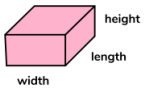
Surface area = $4\pi r^2$



Volume

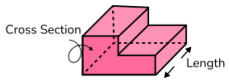
Cuboid

Volume = length x width x height

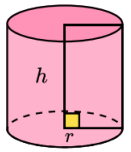


Prism

Volume = area of cross section x length



Cylinder

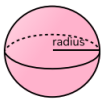


r = radius, h = height

Volume = $\pi r^2 h$

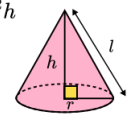
Sphere

Volume = $\frac{4}{3}\pi r^3$



Cone

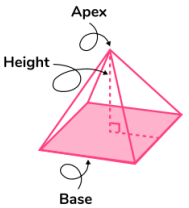
Volume = $\frac{1}{3}\pi r^2 h$



Pyramid

Volume = $\frac{1}{3}Bh$

B = area of base, h = height

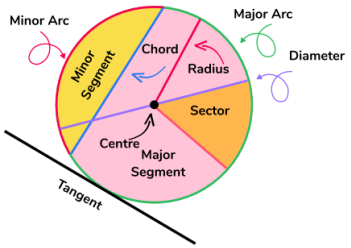


Circles

r = radius, d = diameter

Area = πr^2

Circumference = πd or $2\pi r$



Arc length = $\frac{\theta}{360} \times \pi d$

Arc sector = $\frac{\theta}{360} \times \pi r^2$

Model Answer - Calculator

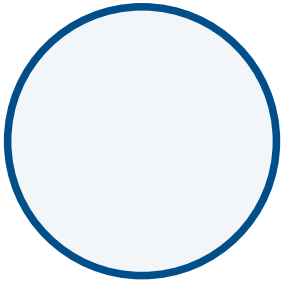
Jenny is making a birthday cake.

The cake is circular with a diameter of 25 cm.

Jenny wants to decorate the cake by placing a ribbon around the edge.

Ribbon is sold in multiples of 15 cm and costs 30p per 15 cm.

What is the smallest amount Jenny must spend to have enough ribbon?



Calculations that are typed into the calculator are also written down.

A diagram may support with visualising the problem.

Decimals are not rounded but instead stored in the calculator. This keeps accuracy until the very end.

The steps of the method are clear down the page.

The answer is carefully copied across to the answer line.

Exam Top Tips!

1. Check through answers

- Once students have completed the paper, assuming they have time, they need to check through their answers. There are some simple, quick things they could look out for:
- units - check that they're right - and know them in the first place.
- have all pages have been answered? Students need to meticulously check that pages haven't stuck together or that there isn't anything at the back that has been missed.
- check algebra questions by re-substitution - students can put their answer into the equation and check that the answer is the same.
- when checking through an answer to a question they were unsure of, use the opportunity to look at it with fresh eyes. Encourage them to try the question again without looking at their original answer. It's really easy to nod along and think something you have written previously is correct when it isn't.

2. Start a new line for each part of workings out

- Encourage students to follow best practice by starting a new line for each stage of their workings out.
- You might want to humanise examiners and communicate to students that they have hundreds of papers to get through in a short amount of time. It can help to make their lives easier By laying out their answers in this way, they are clearly communicating their understanding, which is always a good thing.

3. Only cross something out if they know that it's wrong and they're replacing it with something else

- Examiners hate seeing stuff crossed out! They are predisposed to look to give marks. If something is crossed out, particularly if the crossing out makes it difficult to read, there might be marks that they can't give.
- Encourage students to only cross out anything if they know it's wrong and they're going to replace it with something else.

4. How many marks is it worth?

- Checking how many marks each question is worth can save students time and effort in the exam. They should always work with the following rule in mind: **1 mark = 1 minute**
- Equally, if the question is worth 1 mark, it's probably an indication for how much working out is needed to answer the question.

Exam Top Tips

5. Circle or highlight useful information in the question - especially numbers

- It's probably worth reading through a question a couple of times to digest the information. Some students may have time to do this, others may not. But communicate to students that highlighting or circling important information will help them sift the important information out.

6. Look for the maths they know

- In a pressurised exam situation, it can be easy to get flustered and lose confidence. Communicate to students that they should look for the maths that they do know. There might be signposts in the question, giving them a direction to go in.

7. What can they get down?

- If they're really struggling to know where to start, push students to write down something they do know. This could jog their memories, and help them know what to do for the question. Can they write down a rule? Can they calculate something with the numbers given, even if they're not convinced it's what the question is asking.
- Whatever they put down, it's a start. No exam boards mark negatively. In a mock exam situation, it's a signal to you, their teacher, where they're thinking is at, which helps you to fill that gap.

8. No diagram? No problem

- Is there a diagram? If not, students should consider drawing one, draw their own to help them with the question.

9. Just guess!

- This is especially true for multiple-choice questions. If they don't know the answer or are running out of time, encourage them to guess. There's a possibility they could get themselves a mark, and for the time it takes to draw a tick, it's got to be worth it!

10. Move on

- Advise pupils to move on if they aren't getting anywhere with a question. This not only reduces wasted time but moving onto a question that they can do well, builds confidence during the exam, and boosts their chances of doing well overall. Remaining on a question they are struggling with, undermines confidence and can induce panic - potentially damaging their overall performance - one question isn't worth worrying about.

Exam Top Tips

11. Have a crack at all of the questions

- Easier said than done, but having a crack at all of the questions never hurt any grade.
- Students should never avoid the back of an exam paper because it's 'too hard'. Tell students to read the questions and still have a go using the tips we've already mentioned. Even if they don't come to an answer or the answer is incorrect, they still could pick up marks.

12. Model solutions and mark schemes

- During their prep for the GCSE maths exam, students should look at model answers and mark schemes to understand where the marks come from. If they don't get the right answer in the exam, it's important for them to know that that doesn't mean they'll get zero marks for a question. Trying is everything - and it could be the difference between one grade and another.

13. Breathe!

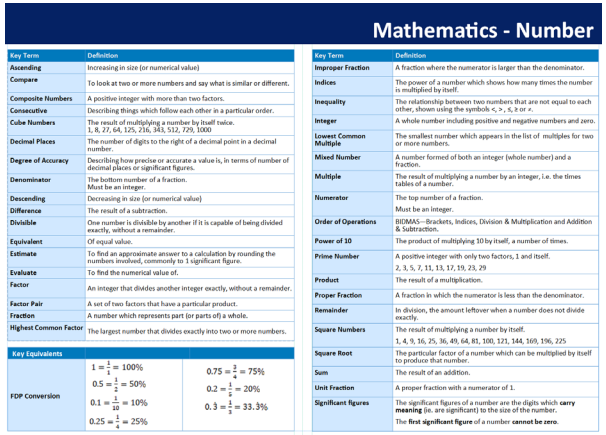
- We've all been there; exams are stressful. It might be helpful to remind students that if they're feeling stressed, or panic is setting in because they don't understand a question, they should take a moment to take some deep breaths. The extra oxygen will help slow their heart rate and give them a few moments of calm to reset.

Bonus tip: do their best

- Finally, arguably the most important tip is to have a go and do their best. None of the GCSE exam boards employ negative marking, so even if a pupil is at a complete loss of what to do on a question, doing something with the numbers may just get them an additional mark or two

Ways to Revise

Use your KO



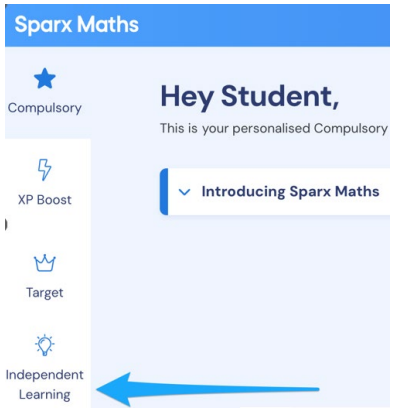
Mathematics - Number

Key Term	Definition
Ascending	Increasing in size (or numerical value)
Compare	To look at two or more numbers and say what is similar or different.
Composite Numbers	A positive integer with more than two factors.
Consecutive	Describing things which follow each other in a particular order.
Cube Numbers	The result of multiplying a number by itself twice. 1, 8, 27, 64, 125, 216, 343, 512, 729, 1000
Decimal Places	The number of digits to the right of a decimal point in a decimal number.
Degree of Accuracy	Describing how precise or accurate a value is, in terms of number of decimal places or significant figures.
Denominator	The bottom number of a fraction. Must be an integer.
Descending	Decreasing in size (or numerical value)
Difference	The result of a subtraction.
Divisible	One number is divisible by another if it is capable of being divided exactly, without a remainder.
Equivalent	Of equal value.
Estimate	To find an approximate answer to a calculation by rounding the numbers involved, commonly to 1 significant figure.
Evaluate	To find the numerical value of.
Factor	An integer that divides another integer exactly, without a remainder.
Factor Pair	A set of two factors that have a particular product.
Fraction	A number which represents part (or parts of) a whole.
Highest Common Factor	The largest number that divides exactly into two or more numbers.

Key Equivalents		
FDP Conversion	$1 = \frac{1}{1} = 100\%$ $0.5 = \frac{1}{2} = 50\%$ $0.1 = \frac{1}{10} = 10\%$ $0.25 = \frac{1}{4} = 25\%$	$0.75 = \frac{3}{4} = 75\%$ $0.2 = \frac{1}{5} = 20\%$ $0.\dot{3} = \frac{1}{3} = 33.3\%$

Key Term	Definition
Improper Fraction	A fraction where the numerator is larger than the denominator.
Indices	The power of a number which shows how many times the number is multiplied by itself.
Inequality	The relationship between two numbers that are not equal to each other, shown using the symbols $<$, $>$, $\leq$ or $\neq$.
Integer	A whole number including positive and negative numbers and zero.
Lowest Common Multiple	The smallest number which appears in the list of multiples for two or more numbers.
Mixed Number	A number formed of both an integer (whole number) and a fraction.
Multiple	The result of multiplying a number by an integer, i.e. the times tables of a number.
Numerator	The top number of a fraction. Must be an integer.
Order of Operations	BIDMAS—Brackets, Indices, Division & Multiplication and Addition & Subtraction.
Power of 10	The product of multiplying 10 by itself, a number of times.
Prime Number	A positive integer with only two factors, 1 and itself. 2, 3, 5, 7, 11, 13, 17, 19, 23, 29
Product	The result of a multiplication.
Proper Fraction	A fraction in which the numerator is less than the denominator.
Remainder	In division, the amount leftover when a number does not divide exactly.
Square Numbers	The result of multiplying a number by itself. 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225
Square Root	The particular factor of a number which can be multiplied by itself to produce that number.
Sum	The result of an addition.
Unit Fraction	A proper fraction with a numerator of 1.
Significant figures	The significant figures of a number are the digits which **carry meaning** (ie. are significant) to the size of the number. The **first significant figure** of a number **cannot be zero.**

Sparx Maths (Independent learning)



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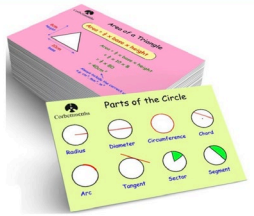
Available for GCSE Higher or Foundation Tier



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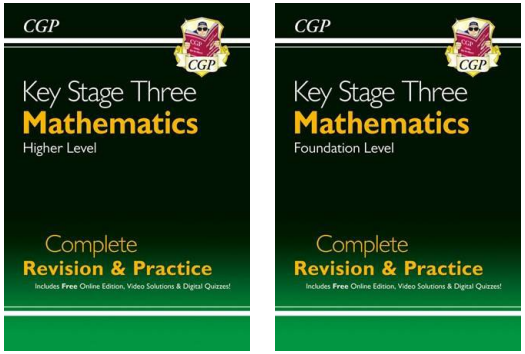

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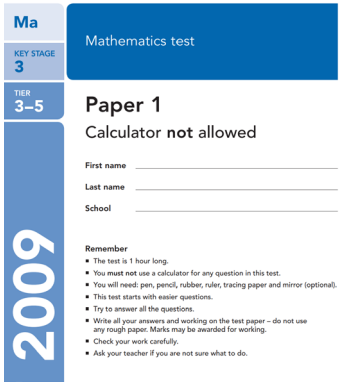
Practice papers



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