

# GCSE (9-1) Mathematics

## Qualification aims and objectives

The aims and objectives of the Pearson Edexcel Level 1/Level 2 GCSE (9–1) in Mathematics are to enable students to:

- develop fluent knowledge, skills and understanding of mathematical methods and concepts
- acquire, select and apply mathematical techniques to solve problems
- reason mathematically, make deductions and inferences, and draw conclusions
- comprehend, interpret and communicate mathematical information in a variety of forms appropriate to the information and context.

Fluency

Reasoning

Problem  
solving







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Old grades	New grades
A*	9
A	8
B	7
C	6
	5 STRONG PASS
D	4
	3
	2
	1
	U

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# GCSE (9-1) Mathematics

- 3 exams
- Each exam 1 hour 30 minutes
- 1 non-calculator paper
- 2 calculator papers
- Foundation and Higher tiers

<b>Foundation</b> (grades 1-5)	<b>Paper 1</b> Non-calculator 33.3% weighting 1 hour and 30 minutes 80 marks 	<b>Paper 2</b> Calculator 33.3% weighting 1 hour and 30 minutes 80 marks 	<b>Paper 3</b> Calculator 33.3% weighting 1 hour and 30 minutes 80 marks 
<b>Higher</b> (grades 4-9)	<b>Paper 1</b> Non-calculator 33.3% weighting 1 hour and 30 minutes 80 marks 	<b>Paper 2</b> Calculator 33.3% weighting 1 hour and 30 minutes 80 marks 	<b>Paper 3</b> Calculator 33.3% weighting 1 hour and 30 minutes 80 marks 

# GCSE (9-1) Mathematics

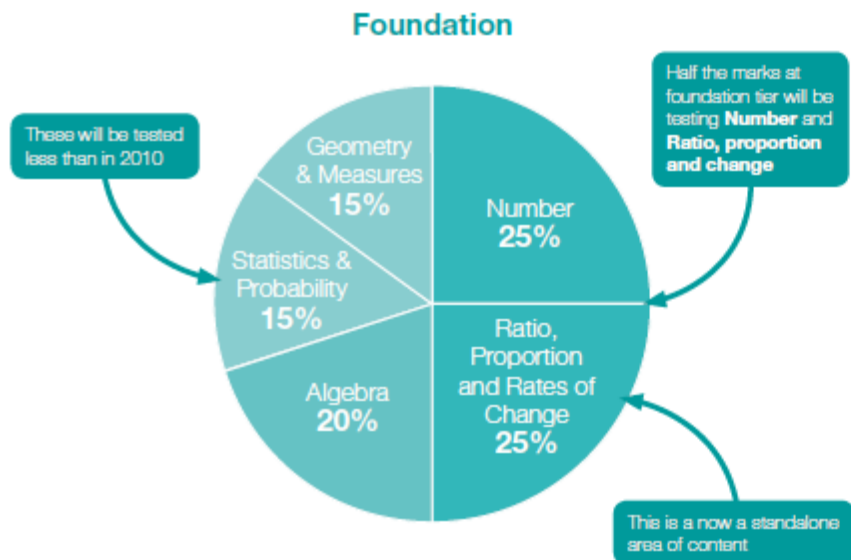
Tier	Topic area	Weighting
Foundation	Number	22 - 28%
	Algebra	17 - 23%
	Ratio, Proportion and Rates of change	22 - 28%
	Geometry and Measures	12 - 18%
	Statistics & Probability	12 - 18%
Higher	Number	12 - 18%
	Algebra	27 - 33%
	Ratio, Proportion and Rates of change	17 - 23%
	Geometry and Measures	17 - 23%
	Statistics & Probability	12 - 18%

About 50% of exam based on number and calculations

About 35% of exam based on number and calculations

# Understanding the changes to content: Foundation

Foundation tier papers will assess the different content domains in these proportions:



(It's worth noting that there's a  $\pm 3\%$  tolerance for each domain area.)

## Changes to content at Foundation Tier

The biggest change to content is at Foundation tier. There are **new topics added** to the Foundation tier for 2015, which in 2010 were assessed at Higher tier only. The list opposite is not exhaustive but includes all the major changes. Full, annotated tables for this and the following lists can be found on the GCSE Maths [support webpage](#).

Find more details, visit  
[www.edexcel.com/gcsemaths2015guide](http://www.edexcel.com/gcsemaths2015guide)



## Topics new to Foundation tier (previously Higher tier only in 2010)

- Index laws: zero and negative powers (numeric and algebraic)
- Standard form
- Compound interest and reverse percentages
- Direct and Indirect proportion (numeric and algebraic)
- Expand the product of two linear expressions
- Factorise quadratic expressions in the form  $x^2 + bx + c$
- Solve linear/linear simultaneous equations
- Solve quadratic equations by factorisation
- Plot cubic and reciprocal graphs, recognise quadratic and cubic graphs
- Trigonometric ratios in 2D right-angled triangles
- Fractional scale enlargements in transformations
- Lengths of arcs and areas of sectors of circles
- Mensuration problems
- Vectors (**except** geometric problems/proofs)
- Density
- Tree diagrams

For both tiers, there will be new knowledge, skills and understanding that your students will be assessed on in the new GCSE Mathematics (9-1).

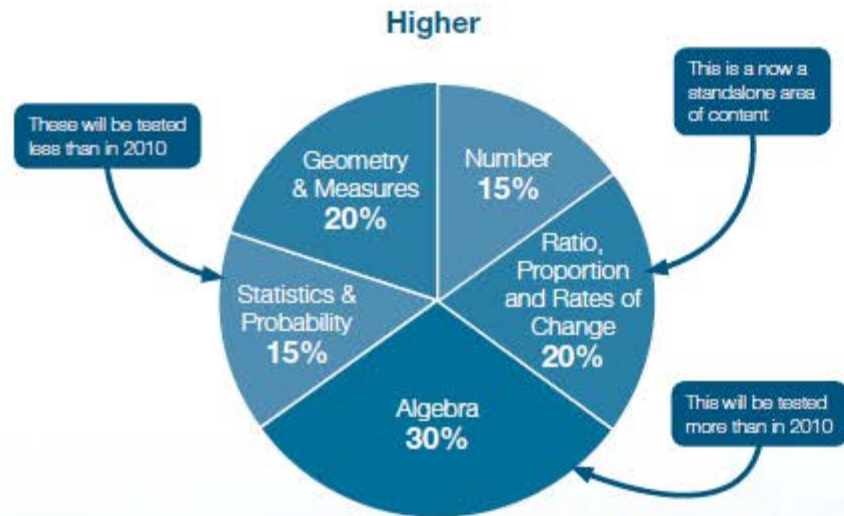
## Topics new to both tiers

- Use inequality notation to specify simple error intervals
- Identify and interpret roots, intercepts, turning points of quadratic functions graphically; deduce roots algebraically
- Fibonacci type sequences, quadratic sequences, geometric progressions
- Relate ratios to linear functions
- Interpret the gradient of a straight line graph as a rate of change
- Know the exact values of  $\sin \theta$  and  $\cos \theta$  for  $\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$  and  $90^\circ$ ; know the exact value of  $\tan \theta$  for  $\theta = 0^\circ, 30^\circ, 45^\circ$  and  $60^\circ$

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# Understanding the changes to content: Higher

Higher tier papers will assess the different content domains in these proportions:



(It's worth noting that there's a  $\pm 3\%$  tolerance for each domain area.)

More content has been added to Higher tier in order to **stretch and challenge** the most able students and better prepare them for studying A level Mathematics, so we'll see the introduction of new **knowledge, skills and understanding** that will be assessed at **Higher tier only**.

## Topics new to Higher tier

- Expand the products of more than two binomials
- Interpret the reverse process as the 'inverse function'; Interpret the succession of two functions as a 'composite function' (using formal function notation)
- Deduce turning points by completing the square
- Calculate or estimate gradients of graphs and areas under graphs, and interpret results in real-life cases (**not** including calculus)
- Simple geometric progressions including surds, and other sequences
- Deduce expressions to calculate the  $n$ th term of quadratic sequences
- Calculate and interpret conditional probabilities through Venn diagrams

Some content previously assessed in the current GCSE Mathematics has been omitted from the new GCSE Mathematics (9-1).

## Omitted topics

- Trial and Improvement
- Tessellations
- Isometric grids
- Imperial units of measure
- Questionnaires
- 3D coordinates
- Rotation and enlargement of functions

In the specification, you will see the content has been divided into three levels:

- **Standard**: this content will be assessed at both **Foundation and Higher tier**; all students should be confident and competent with it.
- **Underlined**: this content will be assessed at both **Foundation and Higher tier**; higher-attaining students should be confident and competent with it.
- **Bold**: this content will be assessed at **Higher tier only**; the highest-attaining students should be confident and competent with it.

Find more details, visit  
[www.edexcel.com/gcsemaths2015guide](http://www.edexcel.com/gcsemaths2015guide)



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<p>Formulae required at the Foundation tier that are <b>not</b> to be provided on a formula sheet include:</p>	<ul style="list-style-type: none"> <li>• Pythagoras' theorem</li> <li>• trigonometric ratios</li> <li>• area of a trapezium</li> <li>• volume of a prism</li> </ul>	$a^2 = b^2 + c^2$ $\sin\theta = \frac{o}{h}, \cos\theta = \frac{a}{h}, \tan\theta = \frac{o}{a}$ $\frac{1}{2}(a+b)h$ <p>(area of cross section) × length</p>
<p>Formulae required at the Higher tier that are <b>not</b> to be provided on a formula sheet include:</p>	<ul style="list-style-type: none"> <li>• the quadratic formula</li> <li>• the sine rule</li> <li>• the cosine rule</li> <li>• area of a triangle</li> </ul>	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ $a^2 = b^2 + c^2 - 2bccosA$ $\frac{1}{2}absinC$

23 Richard wants to find out how often people buy crisps.  
He uses this question on a questionnaire.

How often do you buy crisps?

Often  Sometimes  Never

(a) Write down **two** things that are wrong with this question.

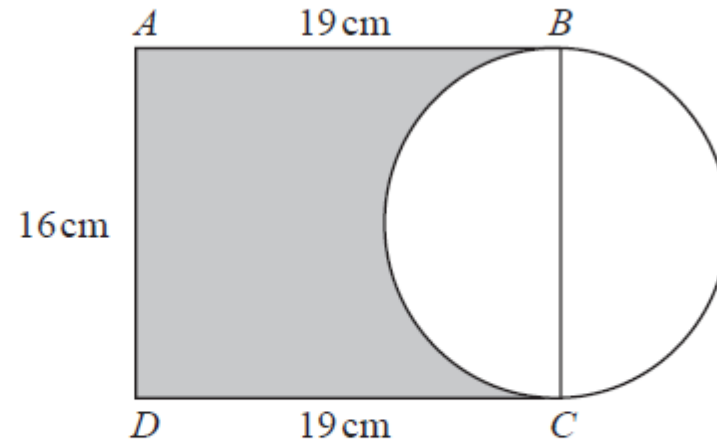
1. ....

2. ....

Foundation  
Last questions



27 Here is a diagram showing a rectangle,  $ABCD$ , and a circle.



$BC$  is a diameter of the circle.

Calculate the percentage of the area of the rectangle that is shaded.  
Give your answer correct to 1 decimal place.



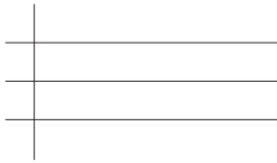
## Higher First questions

1 Chloe recorded the test marks of 20 students.

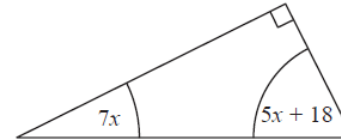
22 29 38 16 36 18 30 21 27 43

14 41 25 38 46 19 48 34 23 46

(a) Show this information in an ordered stem and leaf diagram.



1 The diagram shows a right-angled triangle.



All the angles are in degrees.

Work out the size of the smallest angle of the triangle.

.....  
(Total for Question 1 is 3 marks)

# PHS Maths



- Improvement in outcomes year on year
- Excellent teachers with good knowledge of the new curriculum and exam
- Maths coaches supporting in class
- HW club – every Tuesday in IT5
- Every lesson; GCSE key skills starters and GCSE problem solving questions
- Wednesday after school revision sessions
- Small group coaching sessions
- Online resources; mymaths, methodmaths, mathswatch

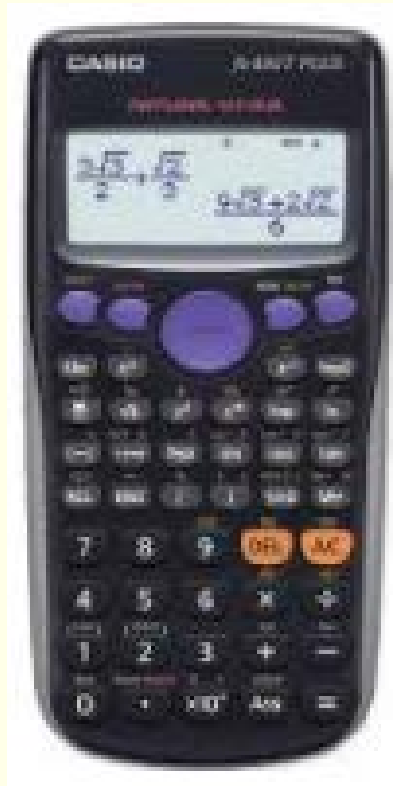
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# How you can help...

- Encouraging **focus** during lessons
- **Numeracy skills**; household budgets, shopping, percentages, exchange rates, speed/distance/time
- **Speak positively about maths** 😊
- Encourage problem solving; games and puzzles
- **Homework**– weekly; complete all questions
- **Revision** – Independent and regular
- **Equipment** – Calculators, rulers and pencils
- **Coaching** – remind/reward

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# Calculator



Casio FX-85GT

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# Maths study support websites:

## Mymaths

Library has links to online lessons and activities

The screenshot shows the MyMaths.co.uk website interface. The browser address bar displays 'app.mymaths.co.uk/myportal/library/9'. The page header includes the MyMaths.co.uk logo with the tagline 'Bringing maths alive', navigation links for 'Assessment Manager', 'Help', and 'Log out', a search bar, and a login section with 'Username', 'Password', and 'Login' fields. A left-hand navigation menu is open, showing categories like 'Library', 'Number', 'Algebra', 'Shape', 'Data', 'fSkills', 'Booster packs', and 'Statistics'. The 'Number' category is selected and highlighted in red. The main content area is titled 'Number' and features a 'Filter: Everything' dropdown. Below this, there is a list of resources for 'Number facts and doubles'. The first resource is '1 Number facts and doubles 1', which includes a description: 'Knowing pairs that add up to 10. Sums and doubles up to 5.' and icons for 'Lesson' and 'Online homework'. Other resources listed include '2 Number facts and doubles 2', '3 Number facts and doubles 3', '4 Number facts and doubles 4', and '2 Number bonds'. The footer contains copyright information for Oxford University Press 2015 and various policy links.


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← → ↻ [www.methodmaths.com/gcse/methodmaths.php](http://www.methodmaths.com/gcse/methodmaths.php) ☆

A STUDENT Score: 2% Grade: U Next Grade: 4

INDEX 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 >

1 Given that  $1793 \times 185 = 331705$   
write down the value of

 (a)  $1.793 \times 185$  331.705 1  
(1)

(b)  $331705 \div 1.85$  179300 1  
(1)


(Total for Question 1 is 2 marks)

INDEX 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 >

Patcham High School June 2013 1H © 2015 methodmaths

Standard form ← Return to Assigned Work

Overview 1 2 3 4 5 6 7 8 9 10

Question Progress 3 / 3 Marks Homework Progress 3 / 29 

Write

a) 31.24 to 1 decimal place

b) 5.275 to 2 decimal places

c) 0.563498 to 3 decimal places


a)  +

b)  +

c)  +

Submit Answer

Rounding to Decimal places View One Minute Version Overview

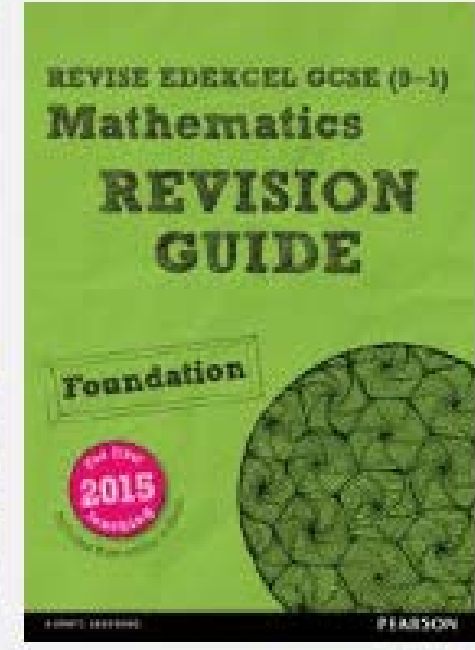
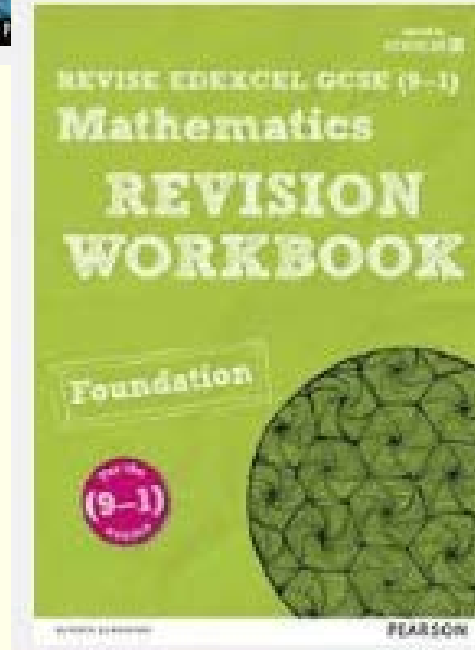
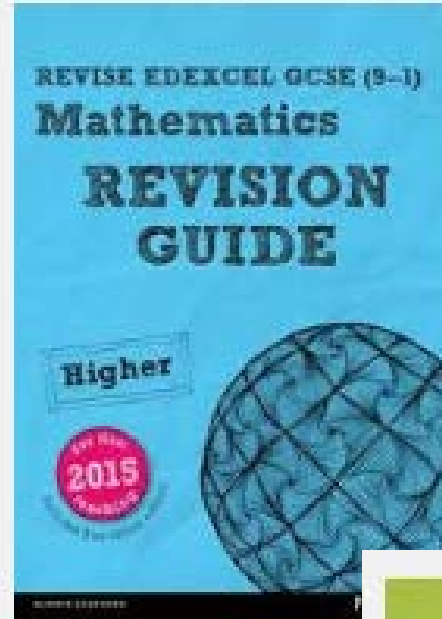
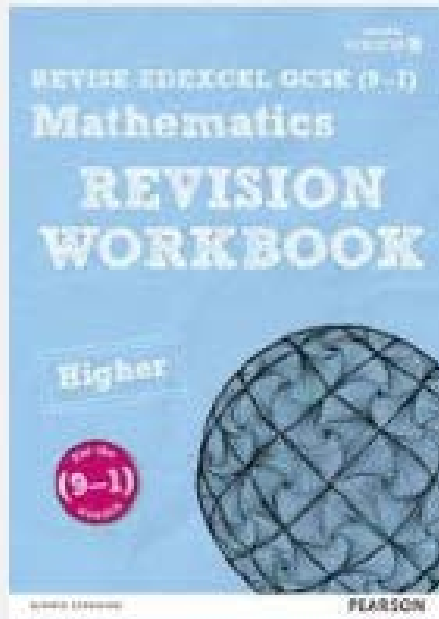


Clip 32

**ROUNDING TO DECIMAL PLACES**

04:33

Standard form



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