



Supporting Achievement in GCSE Maths





- Brief outline of Y11 maths in school between now and May
- Importance of being prepared
- Sparx Maths
- Corbett Maths/OnMaths
- Additional sources of revision support





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Maths in School

- All classes will finish covering new content by February half term (exception being sets 1 and 2 as they have additional Further Maths content)
- Following completion of the scheme of work, lessons will follow a sequence of assessment, review and revision
- In order to ensure effective revision can be planned and support targeted appropriately, we will be running a program of assessments between now and May.
- The aim of this is to:
 - ✓ Provide staff with areas to focus revision sessions on when the time comes
 - ✓ Provide students with their own areas of focus for independent revision
 - ✓ Provide students with practise at exam timing and exam technique
 - ✓ Ensure students are FULLY prepared for the Summer exams
- The schedule has been shared with students via Teams, but they will take place every Thursday Week B
- Students should focus on Summer Exam Revision, NOT cram revising for these assessments





Maths in School

Key Stage 4 Year 11 Mock 3
HIGHER
JUNE 2018 - PAPER 6

Total number of students ->		100	35
Question Number	Topic	Max Mark	Grade
1	Averages and range problem solving	3	2
2	Ratios, convert fraction to percentage	4	4
3	Estimate complex calculations	3	3
4a	Indices with algebraic expressions	2	2
4b	Manipulating powers	3	1
5a	Straight line graphs	3	0
5b	Substitution, solving equations	3	0
5c	Distance between two points	3	0
6	Algebraic inverse proportion	3	0
7	Simple space diagrams	3	0
8a	Speed-time graphs - calculating acceleration	4	0
8b	Speed-time graphs - calculating acceleration	3	0
8c	Speed-time graphs - calculating distance	4	0
9a	Speed-time graphs - problem solving, conversions	2	4
9b	Cubic graphs	3	0
9c	Trial and improvement, iteration	4	0
10	Iteration	4	0
11	Vectors	1	1
12	Congruent triangles problem solving	2	0
13a	Pythagoras theorem, similar triangles	3	0
13b	Volume of a sphere	3	0
14a	Volume, percentage decrease	4	0
14bi	Upper and lower bounds	5	0
14bi	Upper and lower bounds	2	2
15	Upper and lower bounds	5	2
16a	Real life exponential growth	4	4
16b	Box plots	3	1
16b	Box plots	3	1
16c	Box plots	1	1
16d	Box plots, percentage of amounts	4	1
17a	Box plots	1	2
17b	Writing algebraic expressions	2	1
17b	Forming and solving equations	3	2
18a	Bar charts	2	1
18b	Volume of similar shapes	2	1
19	Simplify algebraic fractions with quadratics	3	0
Total		100	35

Don't need to revise this (keep checking when it comes up on future mocks)

Mrs is going to do a revision lesson on this with the whole class

Mr said most people got this correct, but I have got it wrong - add to independent revision timetable





Maths support in School

- Lessons
- Maths Clinic – Wednesday/Thursday 12:15 - 12:45
- Intervention sessions for selected students
- Study support sessions
- Homework





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Being Prepared - Equipment

All equipment can be bought from the school library if needed

(buy calculators through the maths department)



School compasses are well used, so loosen over time and not construct shapes properly

School protractors are well used so the scale might be worn, or scratches on the plastic might make it hard to read accurately

Students need to know the functions of their own calculator





Being Prepared - Formulae

Students will be given a formula sheet in their Summer exams

Higher Tier Formulae Sheet

Perimeter, Area and Volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

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

Volume of a prism = area of cross section \times length

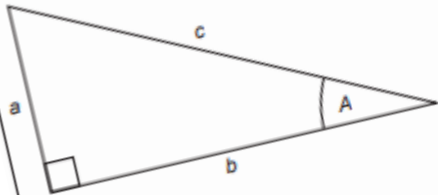
Where r is the radius and d is the diameter:
Circumference of a circle = $2\pi r = \pi d$
Area of a circle = πr^2

The Quadratic Formula

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Pythagoras' Theorem and Trigonometry



In any right-angled triangle where a , b and c are the length of the sides and c is the hypotenuse:

$$a^2 + b^2 = c^2$$

In any right-angled triangle ABC where a , b and c are the length of the sides and c is the hypotenuse:

$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c}$$

In any triangle ABC where a , b and c are the length of the sides:

$$\text{sine rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{cosine rule: } a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area of triangle} = \frac{1}{2}bc \sin A$$

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is the number of times that the interest is compounded:

$$\text{Total accrued} = P \left(1 + \frac{r}{100} \right)^n$$

Probability

Where $P(A)$ is the probability of outcome A and $P(B)$ is the probability of outcome B:

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A \text{ and } B) = P(A \text{ given } B)P(B)$$

Foundation Tier Formulae Sheet

Perimeter, Area and Volume

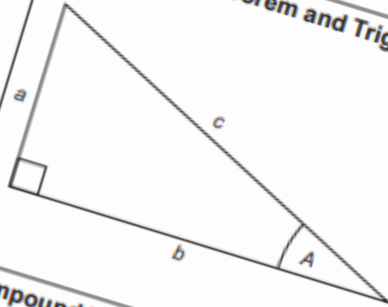
Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

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Area of a circle = πr^2

Pythagoras' Theorem and Trigonometry



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$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

This formula sheet is available on Teams, and students should have it with them whilst revising

They will be given a copy in every maths assessment going forward





Being Prepared - Formulae

Students will be given a formula sheet in their Summer exams

Know their times tables

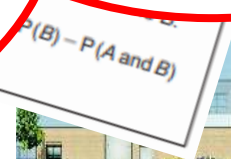
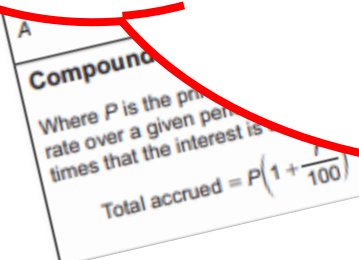
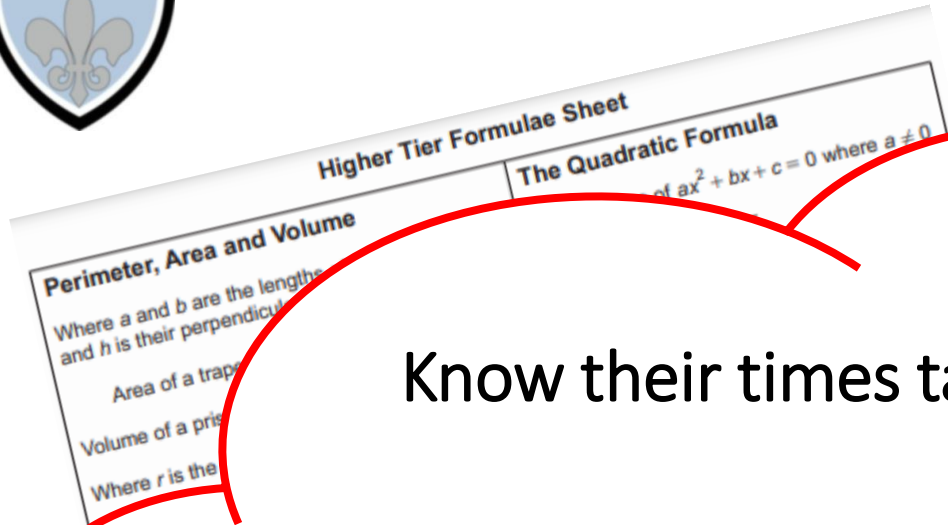
Square Numbers to 15^2

Cube numbers to 10^3

Prime numbers less than 50

Divisibility tests

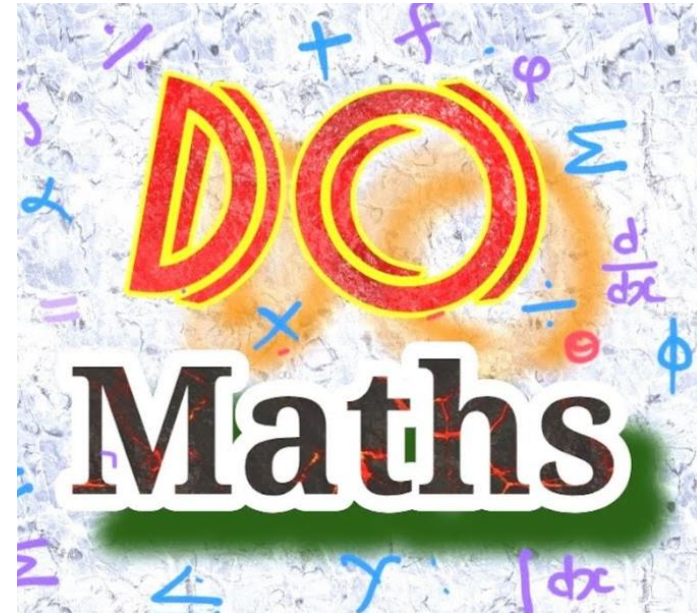
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be given a copy
to their books





Being Prepared – Independent Revision

The best way to revise maths is to




15-20 minutes daily, not a 2-hour stretch once a week





Being Prepared – Independent Revision



Year 11
Knowledge Organiser 2
Mathematics

Topic	Pages
Number Theory	1-2
Fractions	3-6
Percentages	7-10
Algebraic Manipulation	11-14
Analysing Data	15-17

Indices and surds

Basic Index Laws

Multiplication Law: when multiplying with the same base, add the indices
 $3^{10} \times 3^2 = 3^{12}$

Division Law: when dividing with the same base, subtract the indices
 $3^{10} \div 3^2 = 3^8$

Power Law: When a base is raised to more than one index, multiply the indices
 $(2^3)^5 = 2^{15}$

Negative Indices

Evaluate 5^{-1} as a fraction.
 $5^{-1} = \frac{1}{5^1} = \frac{1}{5}$

Evaluate 9^{-1} as a fraction.
 $9^{-1} = \frac{1}{9^1} = \frac{1}{9}$

Evaluate 7^0
 $7^0 = 1$

Any number to the power of 0 is equal to 1.

examples
 $2^{-1} =$ $x^{-3} =$ $3^{-2} =$ $\frac{1}{100} =$ $\frac{1}{64} =$

Fractional Indices

A fractional index requires us to take the root of a number.

An index of $\frac{1}{2}$ is the equivalent of square rooting, so $9^{\frac{1}{2}} = \sqrt{9} = 3$

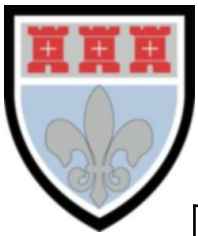
An index of $\frac{1}{n}$ is the equivalent of taking the n th root, so $a^{\frac{1}{n}} = \sqrt[n]{a}$

An index of $\frac{m}{n}$ is the equivalent of taking the n th root and raising it to the m th power, so $a^{\frac{m}{n}} = (\sqrt[n]{a})^m$ which is the same as $\sqrt[n]{a^m}$

examples

Evaluate $64^{\frac{1}{3}}$ $\sqrt[3]{64} = 8$	Evaluate $27^{\frac{2}{3}}$ $= (\sqrt[3]{27})^2 = 9$	Evaluate $(-\frac{8}{27})^{\frac{2}{3}}$ $= \sqrt[3]{(-\frac{8}{27})^2} = -\frac{2}{3}$	$49^{\frac{1}{2}} =$	$125^{\frac{1}{3}} =$
			$x^{\frac{1}{2}} =$	$x^{\frac{1}{3}} =$
			$27^{\frac{2}{3}} =$	$144^{\frac{1}{2}} =$
			$16^{\frac{3}{4}} =$	$x^{\frac{2}{3}} =$
			$25^{-\frac{1}{2}} =$	$1000^{-\frac{2}{3}} =$





Being Prepared – Independent Revision

WEEK A

Wed	Thur	Fri	Sat	Sun	Mon	Tue
School: Complete mock exam 10 min Corbettmaths 5-a-day	School: Maths Clinic 20 min Sparx Homework	10 min Sparx homework 10 min Corbettmaths 5-a-day	20 min Sparx Homework	10 min Sparx homework 10 min Corbettmaths 5-a-day	School: Review mock exam (get QLA) 10 min Corbettmaths 5-a-day	10 min Revise Divide Fractions 10 min Corbettmaths 5-a-day

WEEK B

Wed	Thur	Fri	Sat	Sun	Mon	Tue
20 min Revise mean from frequency table	School: Maths Clinic 20 min Sparx Homework	10 min Revise percentage change 10 min Corbettmaths 5-a-day	20 min Sparx Homework	20 min Revise histograms	10 min Sparx homework 10 min Corbettmaths 5-a-day	10 min Sparx homework 10 min Corbettmaths 5-a-day





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Sparx Maths

- MASSIVE database of videos to support independent learning and revision, with accompanying, instantly marked quizzes to assess understanding
- **Individualised** tasks set each week to revise, consolidate and extend learning

<https://www.sparxmaths.uk/>





Sparx Maths

auth.sparxmaths.uk/oauth2/auth?client_id=sparx-maths-sw&hd=bbcb4189-bb5a-46b9-8ddf-c265b42715e0&redirect_uri=https%3A%2F%2Fstude...

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sparx Student Log In

You're logging in to Sparx at St Mary's Catholic School (Newcastle).
[Not your school?](#)

Log in to Sparx using Microsoft

or

Use your Sparx log in

Username:

Password:
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[Forgotten Sparx login details?](#)

[New Sparx user?](#)

Same
username/password as
used to log on to
computers in school and
onto emails/teams
remotely





Sparx Maths

This is your personalised Compulsory homework. You need to answer every question correctly to complete it.

None available

Compulsory
None available

XP Boost
None available

Target
None available

Sparx Practice

Independent Learning





Sparx Maths

Compulsory
None available

XP Boost
None available

Target
None available

Sparx Practice

Independent Learning

Practice homework is designed to help you learn how to use Sparx. Completing this does not count towards the weekly homework set by your teacher.

▼ Sparx practice homework

16%

Task 1



43%

Task 2



New

Task 3



New





Sparx Maths

sparx Task 1 70 XP | Anna Crosbie MENU

Item A ✓ Correct	Item B ✓ Correct	Item C ✓ Correct	Item D ✗ Answer	Item E ✗ Answer
Item F ✓ Answer	Item G ✓ Answer			

[← Back](#)





Sparx Maths

Home | Calend | Calend | Email - | Y11 inf | Maths | My clas | Class D | Grades | Videos | Pressur | Spa X | multipl | G recordi | + | - | X

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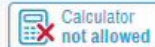
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70 XP

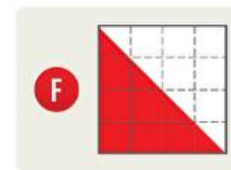
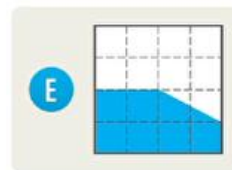
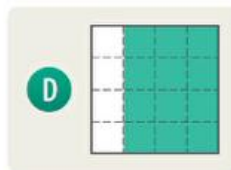
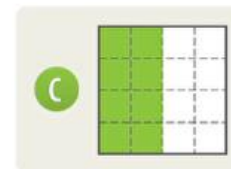
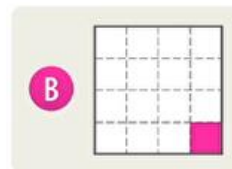
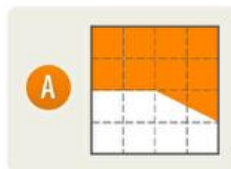
Anna Crosbie

MENU

Bookwork code: C11



Which **two** of the images are **half shaded**?

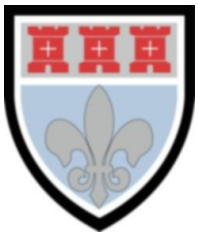


< Back to task

Watch video

Answer >





Sparx Maths

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sparx Homework

70 XP

Anna Crosbie

MENU

Compulsory
None available

XP Boost
None available

Target
None available

Sparx
Practice

Independent
Learning

This is your personalised Compulsory homework. You need to answer every question correctly to complete it.

None available





Sparx Maths

Home | Calend | Calend | Email - | Y11 inf | Maths | My cla: | Class D | Grades | Videos | Pressur | Spc x | multipl | record | + | - | X

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< **sparx** Independent Learning GCSE 3 70 XP Anna Crosbie MENU

Back to Homework

Find topics My activity

Choose to practice any topic from the Sparx library at any difficulty level.

Search for topics: Enter topic name or code

Your curriculum: GCSE

Default level: Level 3

Select a topic:

<p>Number</p>	<p>Algebra</p>
<p>Ratio and Proportion</p>	<p>Geometry</p>
<p>Probability</p>	<p>Statistics</p>





Sparx Maths

Effective Use of Sparx:

- Ensure all compulsory homework tasks are completed by the deadline (one week after set)
- Complete one additional “boost” task each week
- Complete the “target” task each week
- When completing independent revision away from Sparx, make a note of any difficulties and return to the “independent learning” section to find a video and task to support your understanding of that topic





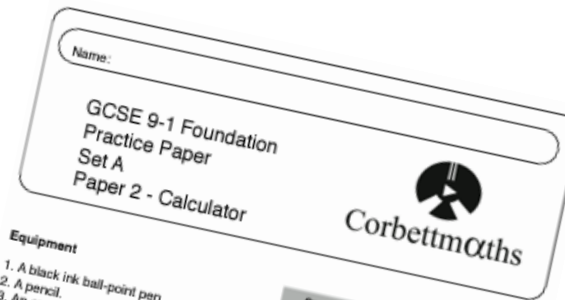
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Corbett Maths

- Videos, worksheets and exam questions (with solutions) for all topics on the GCSE syllabus
- Revision features:
 - 5-a-day (*ask your teacher for the most appropriate level*)
 - Practise Papers



Equipment

1. A black ink ball-point pen.
2. A pencil.
3. An eraser.
4. A ruler.
5. A pair of compasses.
6. A protractor.
7. A calculator.

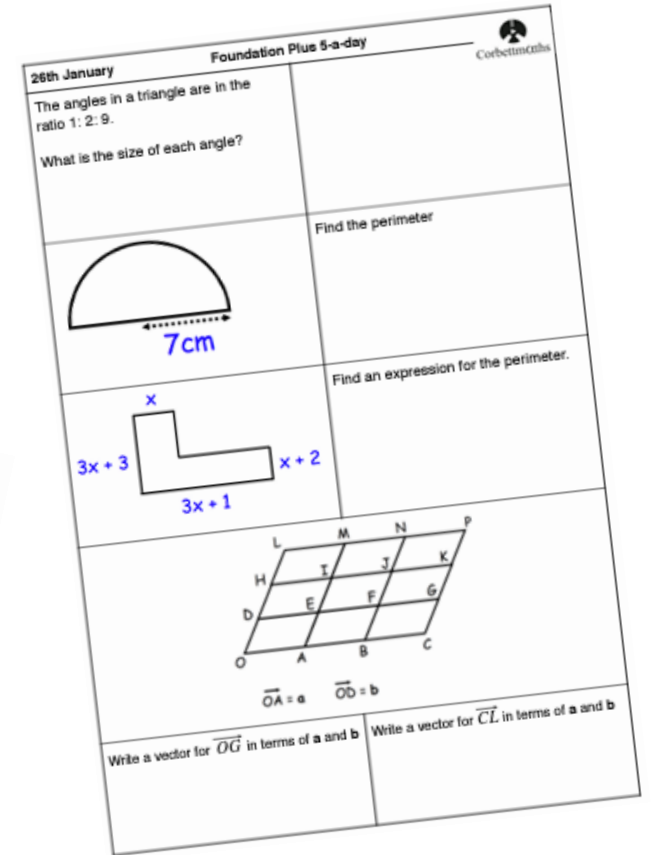
Guidance

1. Read each question carefully.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings.

Information

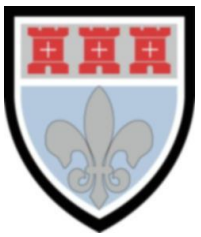
1. Time: 1 hour 30 minutes
2. The maximum mark for this paper is 80.
3. You may use tracing paper.

Question	Mark	Answer
1		1
2		1
3		3
4		4
5		3
6		4
7		5
8		2
9		2
10		4
11		4
12		4
13		4
14		5
15		3
16		4
17		4
18		3
19		2
20		3
21		4
22		4
23		2
24		5
Total	80	3



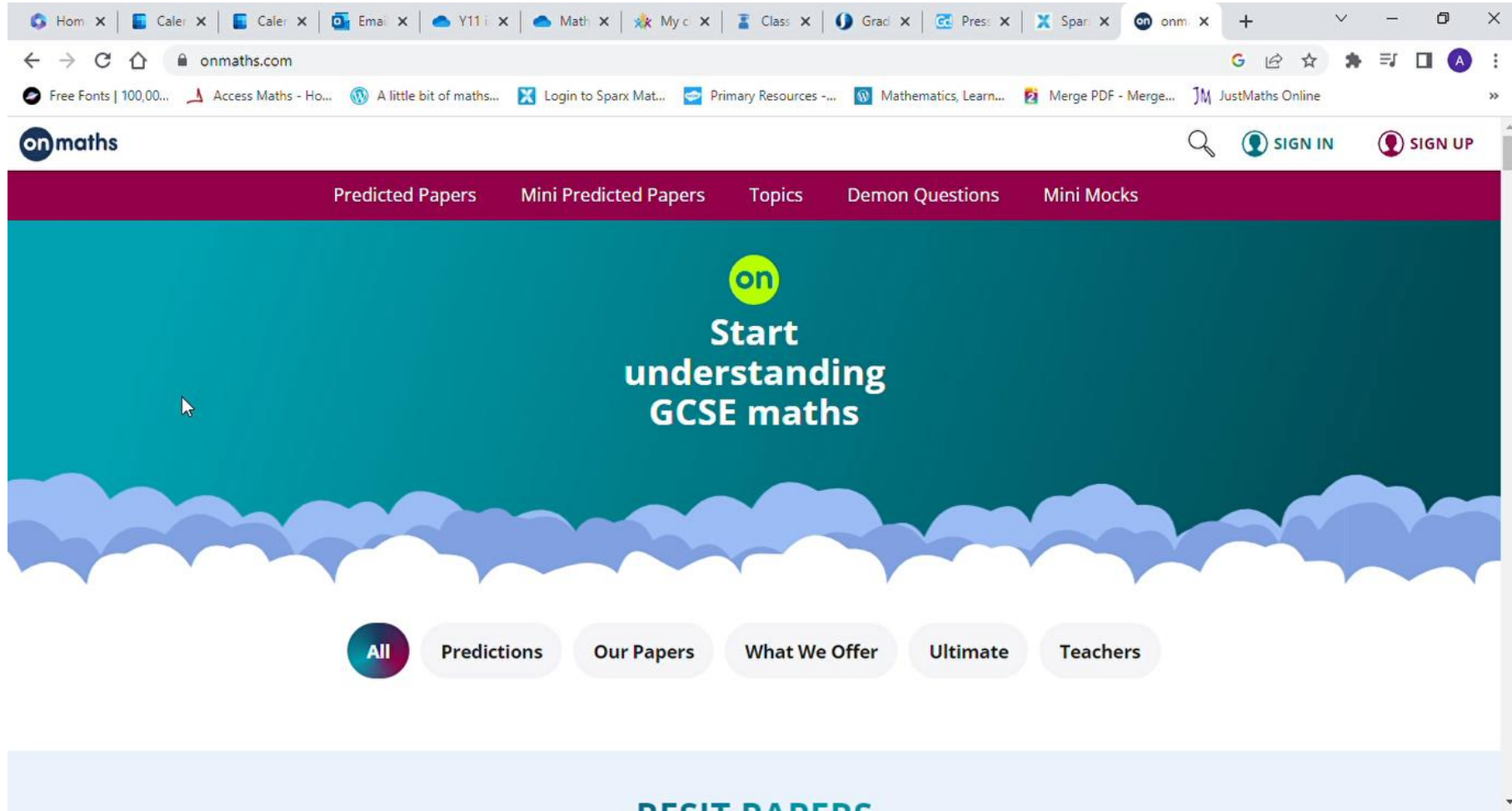
<https://corbettmaths.com/>





OnMaths

- Online self-marking practise papers and revision tasks



<https://www.onmaths.com/>





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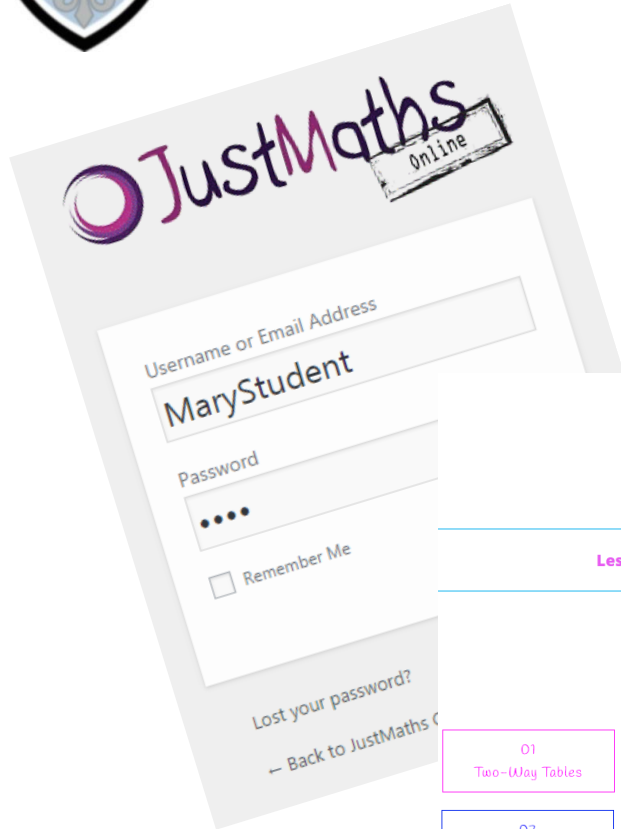


Just Maths

online.justmaths.co.uk

Login: MaryStudent; Password: Mary

- More videos and worksheets, additional exam practise and techniques



JustMaths

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We like to keep things simple so all you have to do is print out the worksheets (link under the video) to work on alongside watching the main videos or if you're looking for a quick reminder watch the "quick hint" video. We suggest that the topics are followed in this order:

01 Two-Way Tables	02 Frequency Trees	03 Rounding & Error Intervals	04 Estimation
07 HCF & LCM	08 Real Life Multiples	09 Fractions 1	10 Fractions 2

JustMaths

The two-way table gives some information about how 100 children travelled to school one day.

	Walk	Car	Other	Total
Boy	15		14	54
Girl		8	16	
Total	37			100

(a) Complete the two-way table.

(3)

JustMaths

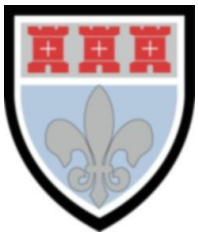
The two-way table gives some information about how 100 children travelled to school one day.

	Walk	Car	Other	Total
Boy	15	25	14	54
Girl	22	8	16	46
Total	37	33	30	100

(a) Complete the two-way table.

(3)





- Printable Revision notes, videos, topic based question booklets, old style exam papers

Maths Genie

Mean from Frequency Tables

Here is a table showing the number of goals a footballer scored in games. Find the mean goals scored per game.

Frequency

when calculating the mean from a table we have to be careful

1. Amanda collected 20 leaves and wrote down their lengths, in cm. Here are her results.

5 6 5 2 4 5 8 7 5 4
7 6 4 3 5 7 6 4 8 5

(a) Complete the frequency table to show Amanda's results.

Length in cm	Tally	Frequency
2		1
3		1
4		3
5		4
6		4
7		3
8		2

- (b) Write down the modal length
(c) Work out the range.

5 cm (2)
6 cm (1)

(4 marks)

2. Rosie had 10 boxes of drawing pins. She counted the number of drawing pins in each box. The table gives information about her results.

Number of drawing pins	Frequency
29	2
30	5

FREQUENCY TABLES

Materials required for examination: Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser. Tracing paper may be used.

Instructions

Use black ink or ball-point pen. Fill in the boxes at the top of this page with your name, centre number and candidate number. Answer all questions. Answer the questions in the spaces provided – there may be more space than you need. Calculators may be used.

Information

The marks for each question are shown in brackets – use this as a guide to spend on each question. Questions labelled with an asterisk (*) are ones where the quality of your answer will be assessed – you should take particular care on these questions and grammar, as well as the clarity of expression.

Advice

Read each question carefully before you start to answer it. Keep an eye on the time. Try to answer every question. Check your answers if you have time at the end.

1. Amanda collected 20 leaves and wrote down their lengths, in cm. Here are her results.

(a) Complete the frequency table to show Amanda's results.

Length in cm	Tally	Frequency
2		
3		
4		
5		
6		
7		
8		

- (b) Write down the modal length
(c) Work out the range.

2. Rosie had 10 boxes of drawing pins. She counted the number of drawing pins in each box. The table gives information about her results.

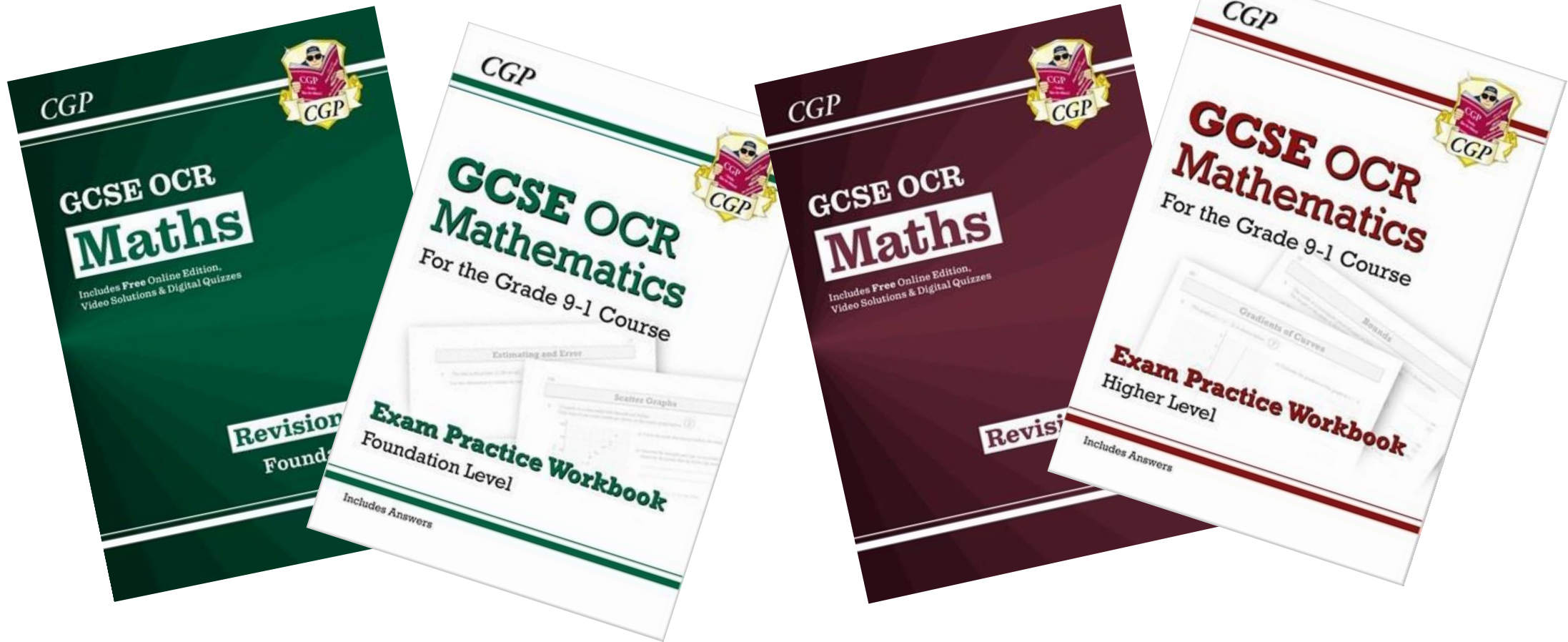
Number of drawing pins	Frequency
29	2
30	5

27 pieces of data
(2 + 1)
from we have to
cross then add down
(5 + 8 + 6 + 6 + 4)
game (2dp)





CGP Revision Guides/Workbooks





CGP Revision Guides/Workbooks

Ratios

Ratios are a pretty important topic — they can crop up in all sorts of questions, so you need to be prepared. If you understand the examples on the next three pages, you'll have a fighting chance in the exams.

Reducing Ratios to their Simplest Form

To reduce a ratio to a **simpler form**, divide **all the numbers** in the ratio by the **same thing** (a bit like simplifying a fraction — see p.12). It's in its **simplest form** when there's **nothing left** you can divide by.

EXAMPLE Write the ratio 15:18 in its simplest form.

For the ratio 15:18, both numbers have a **factor** of 3, so **divide them by 3**.

$$= \begin{matrix} +3 & 15:18 \\ & \swarrow \searrow \\ & 5:6 \end{matrix} +3$$

We can't reduce this any further. So the simplest form of 15:18 is **5:6**.

A **handy trick** for the calculator papers — use the **fraction button**:
If you enter a fraction with the **$\frac{\square}{\square}$** or **$\frac{\square}{\square}$** button, the calculator automatically cancels it down when you press **=**. So for the ratio 8:12, just enter $\frac{8}{12}$ as a fraction, and you'll get the reduced fraction $\frac{2}{3}$. Now you just change it back to ratio form, i.e. **2:3**. Ace.

The More Awkward Cases:

1) If the ratio contains **decimals or fractions** — **multiply**

EXAMPLE Simplify the ratio 2.4:3.6 as far as possible.

1) **Multiply both sides** by 10 to get rid of the decimal parts.

2) Now **divide** to reduce the ratio to its simplest form.

$$= \begin{matrix} \times 10 & 2.4:3.6 & \times 10 \\ = & 24:36 & \\ = & +12 & \swarrow \searrow \\ & 2:3 & \end{matrix} +12$$

For fractions, multiply by a number that gets rid of both denominators

2) If the ratio has **mixed units** — **convert to the smaller unit**

EXAMPLE Reduce the ratio 24 mm:7.2 cm to its simplest form.

1) **Convert** 7.2 cm to millimetres.

2) **Simplify** the resulting ratio. Once the units on both sides are the same, **get rid of them** for the final answer.

$$= \begin{matrix} 24 \text{ mm}:7.2 \text{ cm} \\ = 24 \text{ mm}:72 \text{ mm} \\ = +24 & 1:3 & +24 \end{matrix}$$

3) To get to the form **1:n** or **n:1** — **just divide**

EXAMPLE Reduce 5:54 to the form 1:n.

Divide both sides by 5:

$$= \begin{matrix} +5 & 5:54 \\ = & 1:54 \\ & \swarrow \searrow \\ & 1:10.8 \end{matrix} +5$$

I ain't gettin' on no gosh-darned planet!
Don't be so awkward, case.

The simpler the ratio the better as far as I'm concerned...

Whole number ratios are easy to simplify, but you need to make sure you can do the awkward cases too.

- Q1 Simplify: a) 25:35 b) $\frac{9}{4} : \frac{15}{2}$ c) 8:18 to the form 1:n [4 marks]

Ratios

- 1 Give the ratio 16:240 in its simplest form.



.....
[Total 2 marks]

- 2 In a class of 26 children, 12 are boys and 14 are girls.



- a) What is the ratio of boys to girls? Give your answer in its simplest form.

.....
[1]

- b) In another class, the ratio of boys to girls is 2:3. There are 25 children in the class. How many girls are there?

.....
[2]
[Total 3 marks]

- 3 Brian is making a fruit punch. He mixes apple juice, pineapple juice and cherryade in the ratio 4:3:7.

- a) What fraction of the fruit punch is pineapple juice?

.....
[1]

- b) He makes 700 ml of fruit punch. What volume of each drink does he use?

Apple juice: ml
Pineapple juice: ml
Cherryade: ml
[3]

[Total 4 marks]

