



# A user guide to [www.MathsNetGCSE.com](http://www.MathsNetGCSE.com)

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Version 1.0: 29/07/11. Check the site regularly for updates.

The screenshot shows the MathsNetGCSE.com website. At the top, there is a navigation bar with the MathsNetGCSE logo, a search bar, and user account options. Below the navigation bar, the main content area is divided into several sections:

- Study Online:** A section with a 'Subscribe' button and text describing the online course content, including 2795 pages of material and 1201 fully worked exam questions.
- GCSE Mathematics:** A central section with a 'Subscriptions available now' banner and a table showing page counts for various topics:
 

Topic	Number	Algebra	Geometry
	788	916	807
	128	77	231
- Assessment Content:** A section listing '721 e-tests, arranged as follows:' with a table showing the distribution of tests across different levels (A\*, A, B, C, D, E, F, G) and subjects:
 

Subject	A*	A	B	C	D	E	F	G	TOTAL
Number	8	17	24	46	31	34	42	44	246
Algebra	22	39	43	60	48	14	8	2	230
Geometry	13	27	14	24	25	22	4	5	134
Measures	0	2	1	7	4	1	1	9	25
Probability	1	1	8	1	2	3	2	3	21
Statistics	0	9	12	10	13	4	8	3	50
<b>TOTALS</b>	<b>44</b>	<b>95</b>	<b>102</b>	<b>148</b>	<b>123</b>	<b>78</b>	<b>65</b>	<b>60</b>	<b>721</b>
- Latest Additions:** A list of recent content updates, such as 'ID 2388: Sequences: The nth term: Example 18' and 'ID 2387: Symbols: Forming equations: Example 19'.
- Choose your level:** A section with buttons for 'SPEC', 'Foundation (FND)', and 'Higher (HIGH)', each with associated page counts.
- Next Exams:** A section providing information about upcoming exams and exam dates.
- Extras:** A section for additional resources like 'Interactive Vocabulary'.

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## 0 Introduction

Thank you for subscribing to our on-line service. Individuals, teachers, tutors, schools or colleges can subscribe.

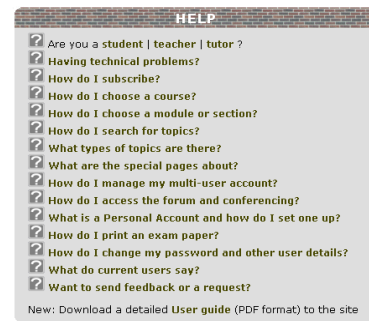
To access the site you need a username and password. If you misplace either there is a facility on the site to send you your password, or alternatively you can contact Chartwelle Yorke who manage all subscriptions at

Chartwell-Yorke Maths ICT Store  
114 High Street  
Belmont Village, Bolton, Lancashire BL7 8AL  
UK - England & Wales




Telephone: 01204 811001

Once logged on to the site you can if you wish change the username and password allocated to you. Many other details about the operation of the site are described on the Help pages on the site, some of which this user guide expands further.

The basic content is arranged by topic. As an example Foundation: Number looks like this:



A list on the right shows the most recent additions to the module. Topics are arranged in a similar order to the specification. Within each topic there are specific subjects and then specific pages. Pages can be of 5 broad types, shown by the symbol icon to the left of each item.

-  Algebraic or analytical, often involving step-by-step solutions to problems
-  Visual or graphical, often involving interactive graphs or diagrams that can be manipulated by mouse actions like drag and drop.
-  On-line tests, or "o-tests", each on marked at once and the scores stored to be viewed later
- Videos – a new area still in development

A sixth type is EXAMPLE. This is essentially based on a past exam paper from one of the examination boards. All pages are interactive in some form or other. The most common type is the first in the list above, which will take the form of a step by step walk through a particular mathematical concept. The page is arranged to encourage the users to figure out the mathematics involved *before* viewing how it should be done. For example, this page explains how to change the subject of an equation.

Algebra is a language with rules.  
 In an equation like  $y = x + 3$ ,  $y$  is said to be the "subject" of the equation. The equation tells you how to find  $y$  if you know the value of  $x$ . If the equation is changed round to  $x = y - 3$ , then  $x$  has become the subject of the equation. This process is called "changing the subject".  
 To change the subject you should proceed step by step, "undoing" the equation or formula provided.  
 For example, to make  $x$  the subject of the equation  $x + 6 = 3y$ , you "undo" the  $+6$  by subtracting 6 from both sides to get  $x = 3y - 6$ . To undo  $+5$  you should subtract 5 from both sides, to undo  $-4$  add 4 to both sides, to undo  $\times 3$ , divide both sides by 3, to undo  $\div 8$ , multiply both sides by 8.

Make  $x$  the subject of this equation:

$$y = 6 + 12x$$

showing clearly each step in the process

$$\begin{aligned} \text{take 6 from both sides} &\Rightarrow y - 6 = 6 + 12x - 6 \\ &\Rightarrow y - 6 = 12x \\ \text{reverse} &\Rightarrow 12x = y - 6 \\ \text{divide both sides by 12} &\Rightarrow 12x \div 12 = y - 6 \div 12 \\ &\Rightarrow x = \frac{y - 6}{12} \end{aligned}$$

Change Restart 

+ black blue green -

Change Restart All

The buttons at the bottom allow the question to be changed (the numbers will change), and the answer to be displayed one step at a time or all at once. Other buttons allow you to increase or decrease the font size or change its colour.

In addition to the basic topic content, which forms the heart of the site and of which there are well over 3700 different pages, there is an on line forum, conferencing facilities, the means of printing and saving exam papers which are created by the user using the questions available on the site, various reference pages and a help page. These are described in greater detail elsewhere.

### **Use of interactive whiteboards**

The pages on the site have been designed with interactive whiteboard (IWB) use in mind, which is why pages like the one above make maximum use of the browser window and have buttons at the bottom of the screen repeated on the left and right. Other pages have displays that include elements that respond to mouse actions like drag and drop. Generally it is rare for a page to require data entry from the keyboard.

Thought it is not easy to cater for all browsers, screen resolutions and IWB models, we have done our best to provide a set-up that should suit most. Pages are optimised primarily for the FireFox browser (which is the one we would recommend) and secondly Internet Explorer.

## 1 For students

This site should enable you to organise your learning and revision program for your coming exams. Your course will be divided into modules and for each one there is a wide variety of on-line material to help you.

Of course it is up to you how you use these resources, but there is one principle that the site recommends throughout: you have to do some work yourself. We will illustrate what we mean by considering this question taken from page ID 4168:

$$\text{Rationalise: } \frac{11 + \sqrt{7}}{4 + \sqrt{3}}$$

First, on paper, you should have a go at it yourself, and then if you were unable to complete it or want to check your answer, refer back to the webpage and use the buttons   to either move through the solution one step at a time or simply see it all at once:

$$\text{Rationalise: } \frac{11 + \sqrt{7}}{4 + \sqrt{3}}$$

$$\begin{aligned} \frac{11 + \sqrt{7}}{4 + \sqrt{3}} &= \frac{11 + \sqrt{7}}{4 + \sqrt{3}} \times \frac{4 - \sqrt{3}}{4 - \sqrt{3}} \\ &= \frac{(11 + \sqrt{7})(4 - \sqrt{3})}{(4 + \sqrt{3})(4 - \sqrt{3})} \\ &= \frac{44 - 11\sqrt{3} + 4\sqrt{7} - \sqrt{21}}{13} \end{aligned}$$

Did that help? Try again, return to the webpage, click  and you will see a new version of this question, for example:

$$\text{Rationalise: } \frac{10 + \sqrt{2}}{11 + \sqrt{7}}$$

You should have a clearer idea of how to do it now, so try again – on paper! Then check your answer with the webpage:

Rationalise:  $\frac{10 + \sqrt{2}}{11 + \sqrt{7}}$

$$\begin{aligned}\frac{10 + \sqrt{2}}{11 + \sqrt{7}} &= \frac{10 + \sqrt{2}}{11 + \sqrt{7}} \times \frac{11 - \sqrt{7}}{11 - \sqrt{7}} \\ &= \frac{(10 + \sqrt{2})(11 - \sqrt{7})}{(11 + \sqrt{7})(11 - \sqrt{7})} \\ &= \frac{110 - 10\sqrt{7} + 11\sqrt{2} - \sqrt{14}}{114}\end{aligned}$$

Did you get it right that time? If so you might want to move on; if not, go round the cycle again. Thus by repetitive practice you can develop the skills necessary to solve problems like this. There are literally thousands of pages like this one the site.

Advanced mathematics consists largely of problem solving, but in order to do that you must have the necessary skills at your fingertips which require practice.

There are many types of pages on the site. There are quizzes, multiple choice tests, drag and drop exercises and videos. See later sections in this guide for more details.

You can use the forum to make contact with other students or ask for help or advice on a topic. You can also create your own exam papers based on any module you like, and print that paper along with a mark scheme to work on away from the computer. These papers can be saved too. See later sections for more on this.

## 2 For teachers and private tutors

You may have subscribed as a private individual or private tutor or as a school or college.

### Individual subscriptions

If you are single subscriber then you have direct access to the forums and conferences set up by us on the site. You will be able to contribute to them but you cannot create your own. You will also be able to create, print and save exam papers that only you can access.

### Multi-user accounts

As a teacher at a school or college that has subscribed to a multi-user account, or as a private tutor who has created a multi-user account for yourself plus a specific number of students, you will have access to management facilities including the forum and conferencing, and when your students have created their usernames on the site you will be able to monitor their access.

On the Manage Student Accounts screen, which you access by clicking on your user name, you can view the status of your students' accounts. You can approve new students or delete old students. You can view whether the student is currently on line or has been on line today, how many times they have been online in the last month, and the dates they were online over the last three months.

#### Student List for The Demo School

User Names / Passwords   

Class(es)	Student	Options	Online	Approve(d)	Delete
12M1	Jeff Beck	  	No (0)	Yes	<input type="checkbox"/>
13M1	Brian Eno	  	No (0)	Yes	<input type="checkbox"/>
13M1	Ella Fitzgerald	  	No (0)	No <input type="checkbox"/>	<input type="checkbox"/>
13M1	Tord Gustavsen	  	No (0)	Yes	<input type="checkbox"/>
12M1	Topper Headon	 	No (0)	Yes	<input type="checkbox"/>
12M2	Billie Holiday	  	No (0)	Yes	<input type="checkbox"/>
12M1	Mick Jones	 	No (0)	Yes	<input type="checkbox"/>
12D	Nils Lofgren	 	No (0)	Yes	<input type="checkbox"/>
12M2	John Mayer	  	No (0)	Yes	<input type="checkbox"/>
12M1	Joni Mitchell	 	No (0)	No <input type="checkbox"/>	<input type="checkbox"/>

### Assessment

A major aspect of the site is on-line assessment. There is a full assessment management system available to the teacher, whereby they can set tasks, monitor their student's progress on those tasks, and analyse results in a variety of ways. In particular individual student progress can be compared with their class and with other schools.

Because this system is extensive and highly developed, there is a separate user guide to assessment available from the site.

## Forums

You can use forums on the site to share issues and create a private forum that only you and your students can access.

Private Forums				
Forum	Threads	Posts	Status	School
Revision ideas	1	2 / 3 Apr, 2009	ST <input checked="" type="checkbox"/>	MyTutor
Up coming lessons	2	4 / 4 Apr, 2009	ST <input checked="" type="checkbox"/>	MyTutor
Past papers	3	14 / 8 Apr, 2009	ST <input checked="" type="checkbox"/>	MyTutor

Through this you can organise your planned tutoring of the students by publishing dates of meetings, deadlines for work to be done, or specific work to be completed using resources on the site. See the section on Forums for more ideas on their use.

## Exam papers

You can create and save on the site exam papers tailored to your specific needs. These could consist of a typical selection of questions making up an exam paper, or you could create a revision paper on a specific topic, "All you need to know about circles", for example.

### Exam Papers

Globally Available Exam Papers			
Module	Title	File Name	Delete
Algebra	20 questions on Changing the subject	20HigherChangingSubject	<input type="checkbox"/>
Algebra	20 questions on Functions & expressions	20HigherFunctionsExpressions	<input type="checkbox"/>
Algebra	20 questions on Graphs	20HigherGraphs	<input type="checkbox"/>
Algebra	20 questions on Quadratic equations	20HigherQuadraticEquations	<input type="checkbox"/>
Algebra	20 questions on Quadratic functions	20HigherQuadraticFunctions	<input type="checkbox"/>
Algebra	20 questions on Simultaneous equations	20HigherSimultaneous	<input type="checkbox"/>
Algebra	20 questions on The straight line	20HigherStraightLine	<input type="checkbox"/>

## Conferencing

Through the forum you can also announce live conferences that you may have with your students.

A conference enables you to communicate in real time with your students (as in instant messaging). You can share best practice by discussing specific topics and referring students to specific pages on the site. They can respond with questions and ideas about the topic under consideration.

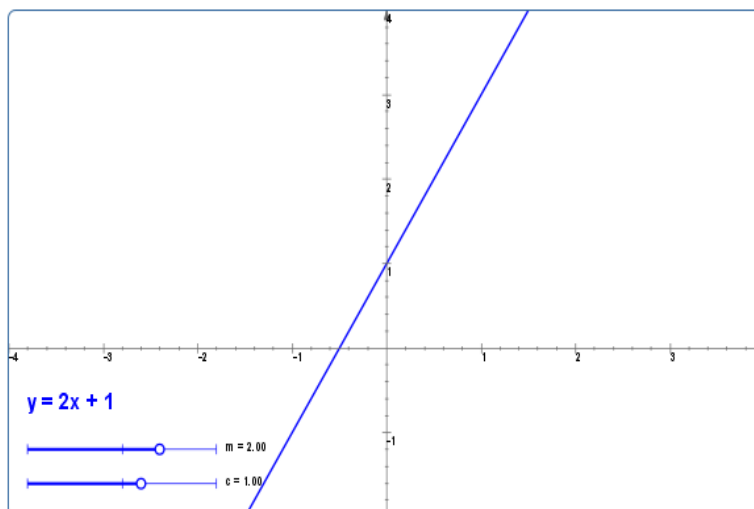
### **3 For professional development**

The various facilities mentioned in the previous section, and expanded in later sections, such as conferencing and forums, do allow the site to be used as the basis for continuing professional development. This may be for established teachers, newly qualified teachers or those seeking advanced skills status. On-line courses can be based around the resources available, with planning and timetabling arranged via the forum. The conferencing facility can be utilised to get teachers together (virtually) and to enable them to discuss aspects of the subject that may cause concern or that are particularly difficult to understand.

Subscription options to the site are flexible. Contact Chartwell-Yorke directly if you wish to subscribe in a way tailored to your specific development needs.

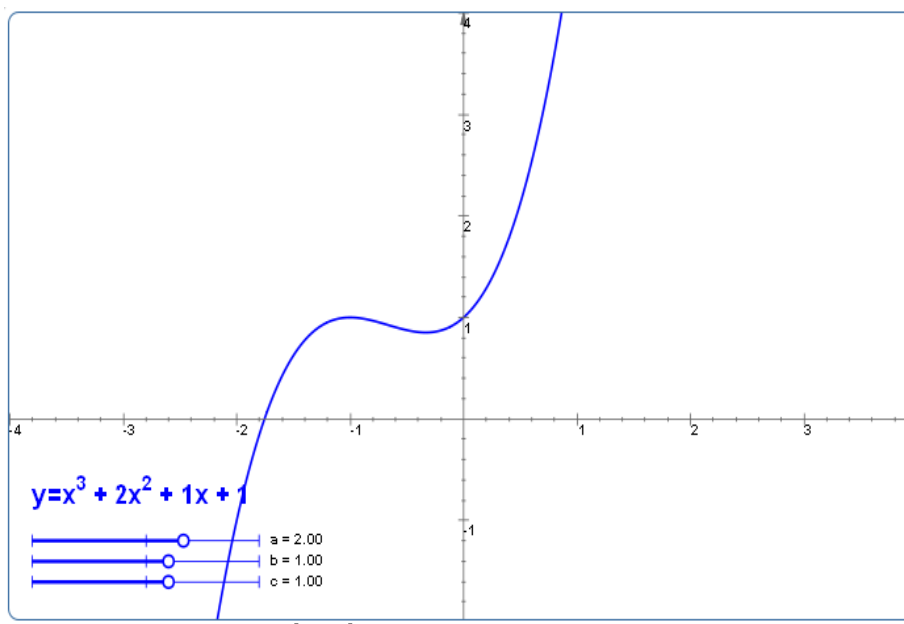
## 4 Graphs

The site features a large collection of interactive graphs. There are various types. A simple one is shown here:

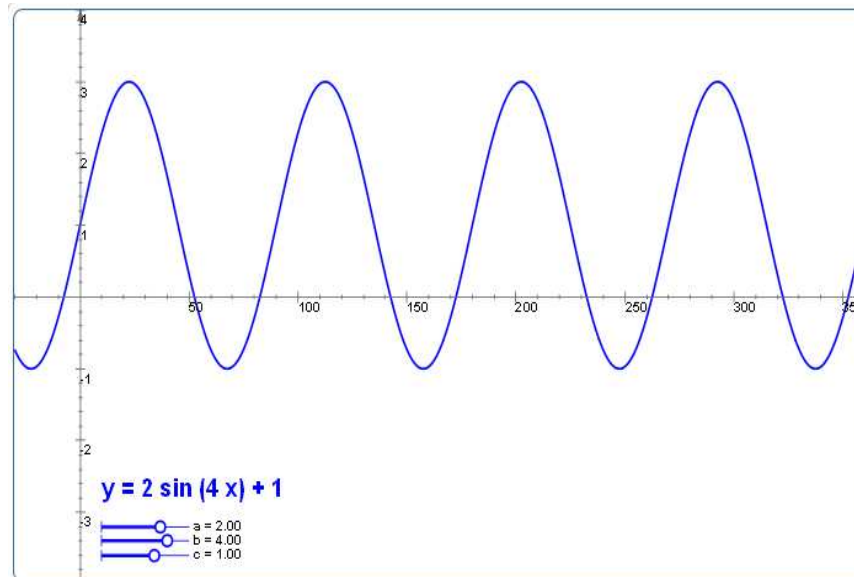


The sliders at the bottom allow you to alter the values of the variables, **m** and **c** in this case, which in turn affect the shape of the graph, **y = mx + c** in this case. Thus an understanding of gradient and intercept can be gained dynamically. Dragging a window across the screen with the mouse will cause the graph to zoom in on that area. Dragging with the right button will drag the whole graph. Shift-click will zoom out.

In this second example, there are three sliders on the graph display.



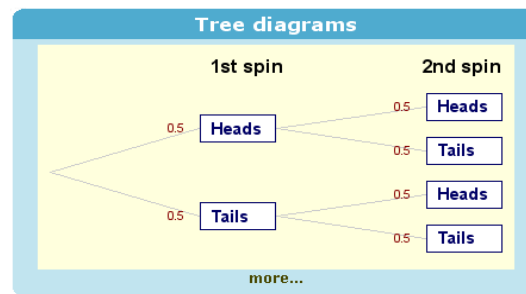
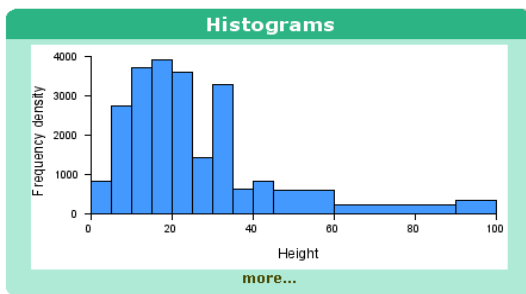
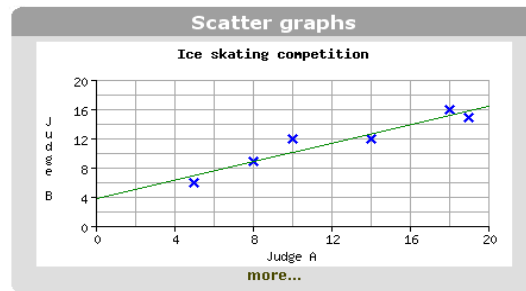
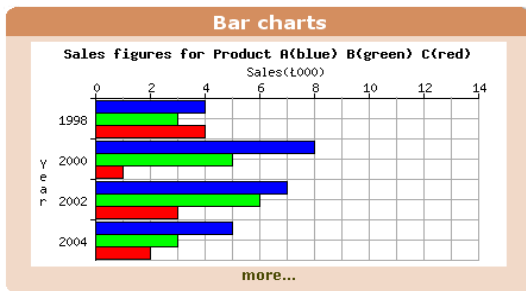
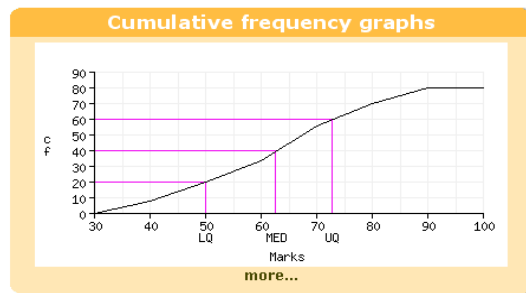
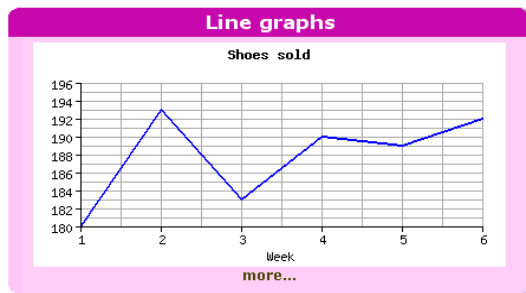
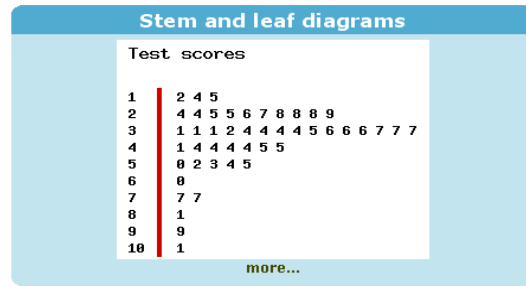
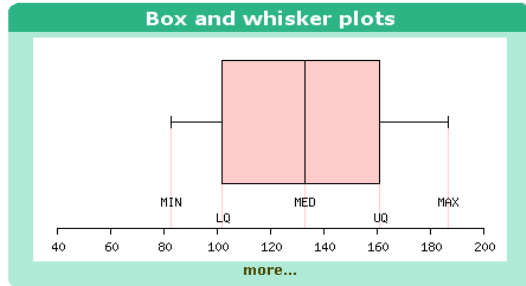
In the following example, the sliders allow you to investigate the effect of changing the variables  $a$ ,  $b$  and  $c$  on the graph of  $y = a \sin(bx) + c$ .



There is a Graph library which collects together all the graphs that are likely to occur on the course.

## 5 Statistical diagrams

The site contains a comprehensive collection of interactive statistical diagrams.



## 6 Quizzes

The site features a large collection of quizzes of various types. They are called **o-tests** and all include some form of direct marking or feedback. For more on this see the guide to assessment available from the site.

### Multiple choice test

Correct:	Score:	%	Difficulty Level:	Marks:	Check Your Score
			D	✓ = 1 ✗ = -1	

1	Calculate $0.2 \times 0.6$	<input type="radio"/> 1.2	<input type="radio"/> 0.12	<input type="radio"/> 8	<input type="radio"/> 0.8	<input type="radio"/> 12
2	Calculate $240000 \div 500$	<input type="radio"/> 12	<input type="radio"/> 48	<input type="radio"/> 4800	<input type="radio"/> 120	<input type="radio"/> 480
3	Which of 0.5, 9%, 5/9, 0.49, 0.0999 is the biggest?	<input type="radio"/> 0.0999	<input type="radio"/> 9	<input type="radio"/> 5/9	<input type="radio"/> 0.49	<input type="radio"/> 0.5
4	What is the total cost of 30 books at £8.92 each?	<input type="radio"/> £26.76	<input type="radio"/> £89.20	<input type="radio"/> £267.60	<input type="radio"/> £2676	<input type="radio"/> £38.92
5	Divide 9509 by 63, giving your answer to 1 dp.	<input type="radio"/> 151.9	<input type="radio"/> 150.9	<input type="radio"/> 151	<input type="radio"/> 150.94	<input type="radio"/> 150.3
6	Calculate $13.7 - 4.4 \times 7.8 + 1.1$	<input type="radio"/> 82.77	<input type="radio"/> -19.52	<input type="radio"/> 73.64	<input type="radio"/> -21.72	<input type="radio"/> -25.46

Each question has five optional answers. A score is given at the top. You lose 1 mark for a wrong selection. The aim is to get 100%, which can only be attained by getting each option correct first time.

### Drag and drop

In this quiz you drag the items on the right across into the correct order.

Use your mouse to drag the calculations into order of size. Start with the smallest.

Correct:	Score:	%	Difficulty Level:	Marks:	Check Scores
			F	✓ = 1 ✗ = 0	

1	<input type="text"/>	<input type="text"/>
2	<input type="text"/>	<input type="text"/>
3	<input type="text"/>	<input type="text"/>
4	<input type="text"/>	<input type="text"/>
5	<input type="text"/>	<input type="text"/>
6	<input type="text"/>	<input type="text"/>

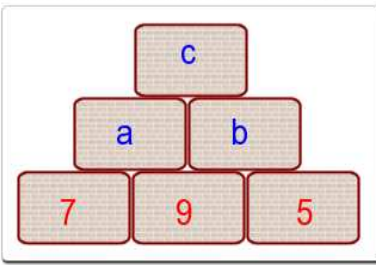
  


$80 \times 200$
$70 \times 80$
$600 \times 110$
$50 \times 70$
$100 \times 120$
$130 \times 150$

## User input


In this quiz you must enter the correct values into the boxes provided.

The number in each brick is the sum of the values in the two bricks immediately underneath.



Correct:  Score:  %  Difficulty Level: G Marks:  = 1  = 0  = 0

- 1 What is  $a$
- 2 What is  $b$ ?
- 3 what is  $c$ ?

Correct:  Score:  %  Difficulty Level: A\* Marks:  = 1  = 0  = 0

- 1 Given that  $y = \frac{x+4}{3x-7}$  and  $z = \frac{x+6}{3x-7}$   
then  $z = \frac{ay+b}{cy+d}$   
What is the value of  $a$ ?
- 2 What is the value of  $b$ ?
- 3 What is the value of  $c$ ?
- 4 What is the value of  $d$ ?

## 7 Exam Pages

The site features a regularly updated collection of examples of exam questions based on recent papers set by the various examination boards. Each question comes with a step by step solution. Here is a typical example:

Make  $t$  the subject of these formulae

(a)  $d = \frac{15}{t}$

(b)  $8(t + e) = 6t + 4$

[Based on OCR MEI 1968, Paper 2A]

(a) multiply by  $t \Rightarrow dt = 15$

divide by  $d \Rightarrow t = \frac{15}{d}$

(b) remove brackets  $\Rightarrow 8t + 8e = 6t + 4$

subtract  $6t \Rightarrow 2t + 8e = 4$

subtract  $8e \Rightarrow 2t = 4 - 8e$

divide by 2  $\Rightarrow t = \frac{4 - 8e}{2}$

Using the options provided, you can display different versions of the same question, each accompanied by its specific mark scheme that can be displayed one step at a time (useful when going through the question on an interactive whiteboard) or all at once. The time you should spend on the question is given in the form of a countdown timer. You can also alter the size of the text and, if appropriate, its display colour.

The ID number of the page (1388 in this case) is given so that you can return easily to this specific page (enter the number in the search box), refer to it when working with other people, identify it when saving your own exam papers for printing or use it when sending feedback to us.

The fact that every exam question contains randomised elements means that this resource is in effect inexhaustible. The teacher or tutor can print and use exam papers with students over the duration of the course, even allow students to practise the same question repeatedly, and still be able to set a formal test based on this material at the end of the course, all without any exact duplication.

## 8 Printing and saving Exam Pages

The site features a regularly updated collection of exam questions based on recent papers set by the examination boards. You can create and save your own examination papers based on these, together with mark schemes. To do this, first choose a general topic and click on PRINT EXAM PAPER.

[Print Exam Paper](#)

You will then see a display of all available exam questions for that module, sorted by topic.

Paper Title: <input type="text" value="Probability Exam Paper - 14 December, 2010"/>			
Paper Size: <input type="text" value="A4"/>		<input type="button" value="Print Exam Paper"/>	
Deadline: <input type="text"/> - <input type="text"/> - <input type="text"/> ?		Optional Group: <input type="text"/>	
<input type="button" value="Clear All"/>	<input type="button" value="Save As"/>	<input type="text"/>	<input type="checkbox"/> Available to all
<b>Probability</b>			
<b>Basic problems</b>	<b>Conditional probability</b>	<b>Independent events</b>	<b>Mutually exclusive outcomes</b>
<input type="checkbox"/> Example 1 (1978) [3/4] <input type="checkbox"/> Example 2 (1985) [2/2] <input type="checkbox"/> Example 3 (2532) [2/2] <input type="checkbox"/> Example 4 (2797) [2/2] <input type="checkbox"/> Example 5 (2941) [4/5] <input type="checkbox"/> Example 6 (2985) [4/5]	<input type="checkbox"/> Example 1 (1986) [4/5] <input type="checkbox"/> Example 2 (2344) [4/5]	<input type="checkbox"/> Example 1 (2773) [3/4] <input type="checkbox"/> Example 2 (2785) [6/7]	<input type="checkbox"/> Example 1 (2826) [3/4]

Each question tells you its ID number, and, in square brackets, its worth in marks and time allocation, ie, **Example 1 (1978) [3/4]** means the question has ID number 1978, is worth 3 marks and should take 4 minutes to complete.

Questions: 13  
Time: 1h 30m  
Marks: 75

Choose the questions that you require. A display to the left of the screen will tell you the total worth of your paper in marks and time. You may choose to make a selection of questions across all the available topics, or alternatively to choose only from one topic to produce a topic test. Enter a title for the paper and a filename and you will then be able to print and save that paper. If you are a teacher then you will see additional options allowing you to set a deadline for the task to be completed by your students and an option to choose a name for your group or class. All papers saved with the same group name will be displayed together. The resulting printout will be in two parts. The first part will be the question paper itself, for example:

Algebra Exam Paper - 14 December, 2010	
3 Questions	Time: 15 minutes Total Marks: 12
Q1 - ID: 1997	[4 marks, 5 minutes]
Simplify fully $\frac{x+2}{4} + \frac{x-8}{3}$ [Based on Edexcel, Paper 5MB2]	
Q2 - ID: 2252	[4 marks, 5 minutes]
Simplify fully $\frac{2x+7}{7} + \frac{2x-6}{4}$	
Q3 - ID: 2254	[4 marks, 5 minutes]
Simplify fully $\frac{4x+3}{4} - \frac{2x-4}{3}$	

The mark scheme will be printed at the end

Algebra Exam Paper - 14 December, 2010 - Mark Scheme	
A1 - ID: 1997	[4 marks, 5 minutes]
$\begin{aligned} \frac{x+2}{4} + \frac{x-8}{3} &= \frac{3(x+2)}{12} + \frac{4(x-8)}{12} \\ &= \frac{3(x+2) + 4(x-8)}{12} \\ &= \frac{3x+6+4x-32}{12} = \frac{7x-26}{12} \end{aligned}$	
A2 - ID: 2252	[4 marks, 5 minutes]
$\begin{aligned} \frac{2x+7}{7} + \frac{2x-6}{4} &= \frac{4(2x+7)}{28} + \frac{7(2x-6)}{28} \\ &= \frac{4(2x+7) + 7(2x-6)}{28} \\ &= \frac{8x+28+14x-42}{28} = \frac{22x-14}{28} \end{aligned}$	

Note that the quality and layout of your print-out will depend to a large extent on what browser, operating system and printer you are using, although we have done our best to cater for the most common configurations. You will find a help page on the site full of advice to help with printing. A useful free utility to help with testing your printouts without wasting paper is the program **PDF Creator** (available from <http://sourceforge.net/projects/pdfcreator/>). Once installed it acts as a printer driver - you print to PDF Creator instead of your normal printer and it will create a PDF file of the output instead.

All papers that have been saved will be available to you later to print again. If you are a single user then you alone will have access to that saved paper. If you are a teacher or tutor then all the students associated with your account will be able to access the paper. Note that because

each question contains a randomised element then each time the same exam paper is printed the questions will differ slightly.

To access saved papers, click on your user name towards the top right of the screen. Then from the options presented, select **Exam Papers**. You will see a display of any saved papers. These saved papers may appear in up to three groups: those created by yourself, those created by your teacher, or those created by us. You will only be able to delete them if you created them yourself. The ones created and saved by us will normally be based on specific exam specifications and specific exam dates. For example in the diagram below all the papers listed are based on the given specific exam. Note that you are not accessing the original examination paper. They can only be obtained from the respective examination board. Instead you are accessing an interactive version based very closely on that exam paper.

## 9 Forums

The website includes a dedicated forum available only to subscribers to the site. To access it click on the **F** logo at the top right of the screen. If this logo appears "white" it simply means you need to register your own personal account with the site. Do this by clicking on your user name and following the options provided.

There are two types of forum: General and Private.

### General Forums

These are set up by us for your use and will usually contain items of general interest. They may include forums specific to the specification you have subscribed to.

### Private forums

As a teacher or tutor in a multi-user account, you can create private forums that only you and your students can access.

Private Forums				
Forum	Threads	Posts	Status	School
Revision ideas	1	2 / 3 Apr, 2009	ST	MyTutor
Up coming lessons	2	4 / 4 Apr, 2009	ST	MyTutor
Past papers	3	14 / 8 Apr, 2009	ST	MyTutor

Through this you can organise your planned tutoring of the students by publishing dates of meetings, deadlines for work to be done, or specific work to be completed using resources on the site. You can also give

advanced notice of a live conference. See the next section for more on this. In addition, the students can use the forum themselves to

- tackle difficult topics together
- build support and sense of community
- organise their time to make better use of it
- compare and improve class or lecture notes
- work through homework together
- verify with fellow students confusing or difficult concepts
- reduce mathematics and exam anxiety

## 10 Conferencing

The website includes a dedicated conferencing facility available only to subscribers to the site. To access it click on the **C** logo at the top right of the screen.

If this logo appears "white" it simply means you need to register your own personal account with the site. Do this by clicking on your user name and following the options provided. Teachers in a multi-user account can set up their own conferences and control who can join it.

When a conference has been set up for specific time and date, the **C** logo will change colour. When that time has come and the conference is live, the logo changes colour again.

To participate in a conference you must request to join it and the moderator of the conference has then to confirm that.

Conferencing allows a kind of "instant messaging", whereby a teacher and students can discuss their work together, as in this example.

The screenshot shows a vertical list of chat messages in a window. The messages alternate between a yellow background (El Nombre) and a light blue background (Mr Dye). The text of the messages is as follows:

- El Nombre** (11 Jun 2009, 14:25:00)  
Excellent. Just working through a few questions.
- El Nombre**  
ID - 377 part (b)  
I know  $dy/dx$  to be  $\cos x/\sin y$   
How would I work out the points at which  $dy/dx$  would be zero? Both  $x$  and  $y$  are between  $-\pi$  and  $\pi$ .
- Mr Dye** (11 Jun 2009, 14:27:11)  
 $dy/dx$  is zero if the numerator is zero
- El Nombre** (11 Jun 2009, 14:28:23)  
So where  $\cos x$  is 0? Where  $x$  is  $\pi/2$
- El Nombre** (11 Jun 2009, 14:28:45)  
Or, I suppose, negative  $\pi/2$
- El Nombre** (11 Jun 2009, 14:33:35)  
How would I work out  $y$  in the above? Couldn't it be anything... as whatever it is is divided into 0.
- Mr Dye** (11 Jun 2009, 14:36:24)  
In ID 377, first find  $\sin x$ , then use the original equation to find  $\cos y$  and hence  $y$ .

The responsibility for moderating the conference and ensuring it is used appropriately remains with the teacher.

A key difference between forums and conferences is that conferences must happen in “real time”. In a conference, those participating must be simultaneously on-line, whereas a forum can be viewed and contributed to at any time. For this reason, a conference needs to be announced in advance, so those interested in contributing are aware of what time it will run. The best way to announce an upcoming conference is via the forum. You could create a forum specifically for announcements of your conferences.

## 11 Reference

In addition to material aimed closely at specification requirement, the site also includes reference material. Each page will include at the bottom a glossary explaining any key words appearing on that page. In addition the site includes a comprehensive interactive glossary, a set of biographies of key mathematicians, and tips and advice on examination technique.

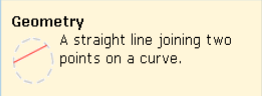
### The Interactive vocabulary

The interactive vocabulary provides an A-Z of key terms in mathematics.

#### VOCABULARY

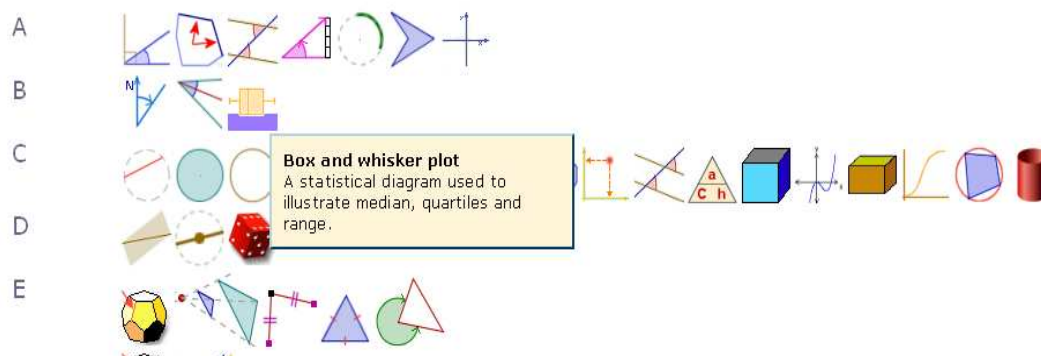
+ - × ÷ = > < ≤ ≥ √

A	acute adjacent alternate angles angle of elevation arc arccos arcsin arctan arithmetic mean arrowhead axis axes	B	bearing BIDMAS bisector box and whisker plot
C	chord circle circular circumference coefficient concave cone congruent consecutive constant construction convex coordinates correlation corresponding angle cuboid cube root cubic cubic curve quadrilateral cylinder	D	decagon denominator diagonal line diameter dice dimensions
E	edge angle gradient	F	factorisation face factor f-angles fraction frequency polygon function
G		H	heptagon hexagon hexagonal highest common factor horizontal hypotenuse hypothesis



A second version presents the same information visually:

#### VISUAL VOCABULARY



## Mathematicians

To help develop your background knowledge of the subject an extensive collection of short biographies of key mathematicians is provided

### MATHEMATICIANS

#### Bernoulli



Johann Bernoulli (27 July 1667 – 1 January 1748) was a Swiss mathematician who studied reflection and refraction of light, orthogonal trajectories of families of curves, quadrature of areas by series and the brachistochrone. In 1691 Johann went to Geneva where he lectured on the differential calculus. From Geneva, Johann made his way to Paris and there he met de l'Hôpital and they engaged in deep mathematical conversations. Contrary to what is commonly said these days, de l'Hôpital was a fine mathematician, perhaps the best mathematician in Paris at that time, although he was not quite in the same class as Johann Bernoulli. De l'Hôpital was delighted to discover that Johann Bernoulli understood the new calculus methods that Leibniz had just published and he asked Johann to teach him these methods. Bernoulli received generous payment from de l'Hôpital for these lessons. After Bernoulli returned to Basel he still continued his calculus lessons by correspondence, and this did not come cheap for de l'Hôpital who paid Bernoulli half a professor's salary for the instruction. However it did assure de l'Hôpital of a place in the history of mathematics since he published the first calculus book *Analyse des infiniment petits pour l'intelligence des lignes courbes* (1696) which was based on the lessons that Johann Bernoulli sent to him. As one would expect, it upset Johann Bernoulli greatly that this work did not acknowledge the fact that it was based on his lectures. The well known de l'Hôpital's rule is contained in this calculus book and it is therefore a result of Johann Bernoulli.

#### Escher



Maurits Cornelis Escher (17 June 1898 – 27 March 1972), usually referred to as M.C. Escher, was a Dutch graphic artist. He is known for his often mathematically inspired woodcuts, lithographs, and mezzotints. These feature impossible constructions, explorations of infinity, architecture, and tessellations.

#### Descartes



Rene Descartes (March 31, 1596 - February 11, 1650), also known as Renatus Cartesius (Latinized form), was a highly influential French philosopher, mathematician, scientist, and writer. He has been dubbed the "Father of Modern Philosophy" and the "Father of Modern Mathematics," and much of subsequent Western philosophy is a reaction to his writings, which have been closely studied from his time down to the present day. His influence in mathematics is also apparent, the Cartesian coordinate system that is used in plane geometry and algebra being named for him, and he was one of the key figures in the Scientific Revolution.

His system of coordinate geometry was described in *La Geometrie*, published at Leiden in 1637.

#### Euclid



Euclid fl. 300 BC, also known as Euclid of Alexandria and the "Father of Geometry", was a Greek mathematician of the Hellenistic period who was active in Alexandria, almost certainly during the reign of Ptolemy I (323 BC - 283 BC). Little is known about Euclid other than his writings. What little biographical information we do have comes largely from commentaries by Proclus and Pappus of Alexandria; Euclid was active at the great Library of Alexandria and may have studied at Plato's Academy in Greece. The date and place of Euclid's birth and the date and circumstances of his death are unknown.

His *Elements* is the most successful textbook in the history of mathematics. In it, the principles of what is now called Euclidean geometry are deduced from a small set of axioms. Euclid also wrote works on perspective, conic sections, spherical geometry, and rigor.

## 12 Technical requirements

This site has been tested on a number of Operating Systems such as Windows, Mac OS X (10.3 onwards recommended) and Linux (Ubuntu), and web browsers such as IE (Internet Explorer), FireFox, Opera, Safari and Chrome. This testing will continue as new versions of browsers are published. The site also uses a wide range of methods of interactivity. Your browser will need to be enabled for Java and Javascript and must accept cookies. If you are in doubt about the set-up of your computer then use the option on the Help page to check your own computer system.

IE8 Users Please Note: We are aware of problems with the release version of IE8 that prevent the full display of some pages. If you are experiencing this problem please click the Compatibility View icon which you will find next to the address bar near the top of the IE8 browser - this will switch in IE7 compatibility. Alternatively, please use another web browser such as FireFox or any of the others mentioned above.

Your computer	
Web Browser	<input type="text"/>
Operating System	<input type="text"/>
Screen Resolution	<input type="text"/>
JavaScript	<input type="text"/>
Java Installed	<input type="text"/>
Java Enabled	<input type="text"/>
Cookies	<input type="text"/>
IP Address	<input type="text"/>
<input type="button" value="Check Computer"/>	