
The Inside Track to GCSE Success

Maths

Students' Reference Manual

The Inside Track to GCSE Success Maths: Students' Reference Manual

Copyright © 1996 Insider Knowledge Software Ltd, Manchester, UK

Published by Longman Logotron

All rights reserved

No part of this publication, either the whole or any part thereof may be reproduced, transmitted, transcribed, stored in a retrieval system or translated into any language or computer language in any form, or by any means, electronic, mechanical, optical, chemical, manual or otherwise, except as permitted under the licence agreement, without the prior express written permission of the author(s) or the publisher.

Microsoft and Windows are registered trademarks of Microsoft Corporation.

Past Exam Questions

We would like to thank the following Examination Groups for permission to reproduce examination questions:

Northern Examinations and Assessment Board (NEAB); Midland Examining Group (MEG); Welsh Joint Education Committee (WJEC).

Whilst permission has been granted by the above Examination Groups to reproduce their questions, the answers, and hints on answers, are the sole responsibility of Insider Knowledge Software Ltd and have not been provided or approved by the Group.

Answers, Hints and Tutorials

These have been provided by the following senior examiner working for Insider Knowledge Software Ltd:

Mr E Cockram Chief Moderator for NEAB Coursework in Maths, former Examiner

A detailed list showing the source of all the past exam questions used in the program can be found on the CD in the file Copyrite.txt in the \manuals directory.

Credits

Software: Tim Ritchings, Alan Wall, Mike Turega

Interface Graphics: Sarah Mayhew

Sound & Music: Patrick Dineen

Voice of Dan the Man: Mike Nelson

Data Entry: Mandie Donaldson, Julius Drumer, Paul Holt

Project Management: David Jaffa

Contents

The Inside Track to GCSE Success.....	4
Screen Setting.....	4
How To Use The Program.....	5
Opening Maths and Exiting the Program.....	5
Tiers and Target Grades.....	5
Tutorials and Key Points.....	5
Doing Questions.....	6
Marking Your Answers.....	6
Overall Performance.....	6
Strategy for Success.....	7
Maths Formula Sheet.....	8
Lower Tier.....	8
Additional Material: Middle Tier.....	9
Additional Material: Higher Tier.....	11

The Inside Track to GCSE Success

We all know students who somehow manage to bluff their way through exams even though they seem to have hardly done any work all year and are always in trouble for messing about in class and not handing work in. Similarly, there seem to be hard workers who always do their work on time but when it comes to the exam, their performance just isn't up to scratch.

Why does this happen? The bluffer is not brilliantly clever and has not been working really hard without anyone knowing. Similarly, the hard worker may just have come unstuck somehow in the exam, though they do know their subject. Sometimes the system doesn't seem fair, and indeed it isn't fair, but if you are on the ball you can make it work to your advantage!

At Insider Knowledge Software we have recruited a team of senior examiners and persuaded them to spill the beans for the first time about the real secrets of exam success.

The Inside Track aims to improve your GCSE grades dramatically by:

- telling you what the marks are for
- getting you used to working against the clock so you do not run out of time in the actual exam
- giving you everything you need in one package
- making it fun!

Screen Setting

The program will work best with a screen setting of $640 \times 480 \times 256$ colours.

You should check your screen setting before you run the program. You can do this using Windows or the software which came with your video card.

How to Use the Program



Double-click the icon in Program Manager. You will be asked to enter your name and choose a password. Do not forget your password!

Opening Maths and Exiting the Program



Select Maths from the rack of CDs and open it by pressing Open.



To close Maths, press Replace, and the CD will return to the rack.



Once you have closed Maths, you can then exit the program by clicking Power.

Tiers and Target Grades

In Maths GCSE there are three Tiers: Higher, Middle and Lower. If your teacher has not already chosen a Tier for you, Inside Track will ask you which Tier is right for you.

The program will also ask you for a Target Grade. Enter the GCSE grade you feel that you can get with good revision, but be realistic about this, or you will not get the most out of the program.

NOTE: The program will not accept a Target Grade which is not awarded at your Tier. For instance, if you select Middle Tier, the program will not accept a Target Grade of A, because As are not awarded at Middle Tier.

Tutorials and Key Points



Look at the tutorials on screen, which tell you how to approach exams, especially How Maths is Marked.



Click on the key icon to look at the key points on each topic before trying the questions.



Dan the Man is there to help you throughout the program. Click on him if you want him to repeat anything he says.

NOTE: Dan the Man will only appear if you have a sound card. If you don't, instructions will appear on screen instead.

Doing Questions

NOTE: You will be answering questions on paper, then marking your work on screen. Before you start you will need a pen, calculator, paper, graph paper, ruler, protractor and compass.



Click OK to try some questions on a topic. You will be working against the clock.



Go through the questions until you come to the marking icon which will take you to the answers.

Marking Your Answers

You will be shown the answers on screen. Compare this with the answer you have written and click a mark box for each point you got right. This will give you a tick . Take your time over the marking so that you learn what the examiner is looking for.



If you do not understand an answer, check whether the hints button is flashing. There are helpful tips here to point you in the right direction.

Overall Performance



The slider on the graphic equaliser tells you what percentage of topics you have tried at least once (from 0% to 100%).

Each time you finish marking you will be given a grade for your work. These grades are displayed beside the topic name. There is more than one set of questions for most topics. Your latest grade is shown in blue text until you have covered everything in a topic; your latest grade is then shown in black text.

When you have covered enough topics you are told your likely overall grade and this is displayed on the graphic equaliser.

Strategy for Success

FIRST: Look at the tutorials on screen, especially How Maths is Marked.

SECOND: Try all the topics once.

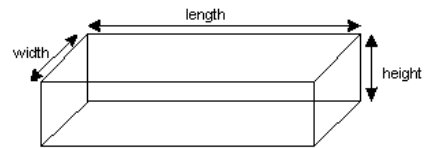
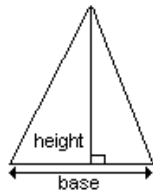
THIRD: Practice your weaker topics in order to improve your likely overall grade.

Maths Formula Sheet

These formulae will help you to do the questions in this program. You will be given a formula sheet similar to this in your exam.

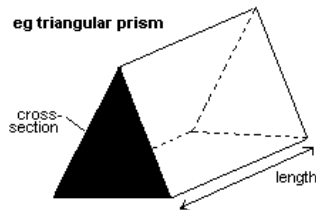
Lower Tier

Shape and Space

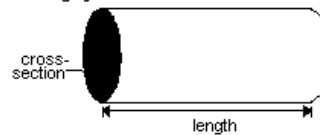


Area of a triangle = $\frac{1}{2} \times \text{base} \times \text{height}$; Volume of a cuboid = length \times width \times height

eg triangular prism



eg cylinder



Prism (including cylinder): Volume = area of cross-section \times length

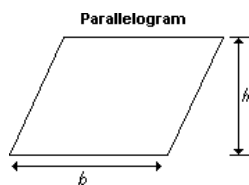
Handling Data

Probability of an event with equally likely outcomes is:

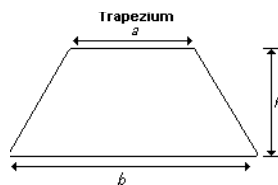
$$\frac{\text{number of favourable outcomes}}{\text{total possible outcomes}}$$

Additional Material: Middle Tier

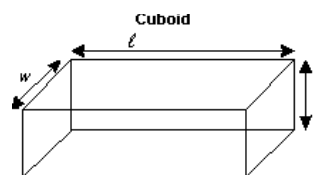
Mensuration



$$\text{Area} = bh$$



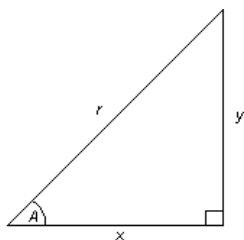
$$\text{Area} = \frac{1}{2} (a + b)h$$



$$\text{Volume} = lwh$$

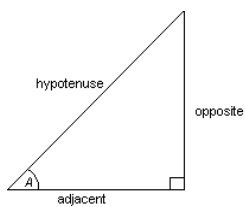
Trigonometry

Right-angled triangle



$$r^2 = x^2 + y^2 \text{ (result of Pythagoras)}$$

$$x = r \cos A, y = r \sin A, y = x \tan A$$



$$\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan A = \frac{\text{opposite}}{\text{adjacent}}$$

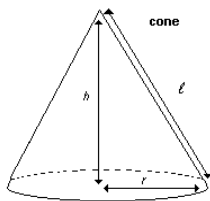
Number

Standard form is $a \times 10^n$ where $1 \leq a < 10$ and n is an integer.

Additional Material: Higher Tier

Mensuration

Cylinder (radius r , height h):	Area of curved surface = $2\pi rh$
Sphere (radius r):	Volume = $\frac{4}{3} \pi r^3$ Area of surface = $4\pi r^2$
Pyramid (including cone):	Volume = $\frac{1}{3} \times$ area of base \times height
Cone (radius r , height h):	Area of curved surface = πrl



$$\sqrt{h^2 + r^2}$$

where l = slant height =

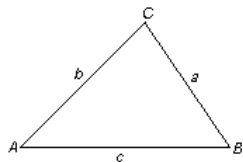
Algebra

The quadratic equation $ax^2 + bx + c = 0$ has solutions:

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

Trigonometry

Any Triangle



In any triangle ABC:

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\text{Area of triangle ABC} = \frac{1}{2} ab \sin C$$