The expert

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Marking the mocks

The present format of the mock exams is that in most schools they take place at the end of January or early February, four months before the real exams. The timing of the mock exams has more to do with the dates of the mid-term break than anything else. The purpose of the mock exams is to give students a trial run at a Junior or Leaving Cert exam and in so doing identify their strengths and weaknesses. The reality is very different.

What are they?
In January or February very few students have finished their courses. As a result they will be sitting an exam (and be expected to do well) where they may have covered less than 75 per cent of the content of the paper. To counteract this, teachers often do sections of the course out of sequence so that students will have better options or they tell students they will delete questions on parts of the course not covered and replace them with extra questions on topics already covered.

Who sets the mock exams?
The mock exams are set by people employed by commercial companies, not by the examinations commission. The companies provide exam papers and a correction service

The exam papers are set by teachers, some of whom may not be teaching the subject at the level they are setting the exam (in the past, one of the companys had a teacher who set questions on the higher level maths which had been taken off the course five years earlier). The quality of mock exam papers can vary dramatically from company to company and from subject to subject. My advise to teachers is to get samples of the exam papers from all the providers and then decide where to source the exam papers. It is never a good idea to source all exam papers from one company.

Who corrects the mock exams?
The companies would have us believe that all their correctors are experienced examiners and, to be fair, some of the companies do employ excellent correctors, usually retired teachers. But the reality is that people do this boring tedious job for the money, with many correctors correcting up to 500 exam papers in a week. The quality can be mixed, and teachers often send papers back to the company to be re-corrected. Companies often take several weeks to return the corrected papers to the schools causing major disruption. I have some maths papers which were obviously corrected by someone who knew nothing about maths (they just followed the marking scheme; if the answer was not covered by the marking scheme, it was marked wrong). Also, on many occasions no attempt marks were given.

The Maths you need to know

If you cover all the angles and learn the maths listed on these pages you'll be setting yourself up for top marks in your Leaving Cert Maths exam

Leaving Cert Ordinary Maths – Paper one

Question 1 – Arithmetic

(a) You must be able to find Compound Interest
(b) You must be able to find the cost price when given the percentage profit.
(c) You must be able to work out a person's take-home pay if given their gross pay, tax credits and tax rates. Some textbooks may not have information on tax credits.
(d) You must be able to handle numbers written in scientific notation.
(e) You must be able to deal with percentage errors.
(f) A knowledge of working with ratios is a must.
Practise using the 2007, 2006, 2005 and 2004 papers.

Question 2 – Algebra

This is the first of two questions on algebra
(a) You must be able to solve an inequality.
(b) You must be able to solve simultaneous equations, either two linear equations or a linear and a quadratic.
(c) You must be able to write a given expression in index form, and solve an index equation. You must know the rules of indices.
Practise using papers from 2007, 2006, 2004 and 2003.

Question 3 – Algebra

(a) You must be able to write one thing in terms of another (manipulation of formulae).
(b) You must be able to use the factor theorem i.e. to find the three roots of a cubic equation.
(c) You must be able to answer questions on the graph of a quadratic function, or, given a quadratic function, to find the coefficients of x and the independent term. The part c of this question can be quite varied.
Practise using 2006, 2005 and 2004 papers.

Question 4 – Complex numbers

(a) You must be able to add, subtract, multiply and divide complex numbers, and find the modulus and the conjugate.
(b) You must be able to solve a Quadratic Equation which has complex roots (use the roots formula and don't forget that $i = \sqrt{-1}$.
(c) You must be able to plot complex numbers on an Argand diagram.
(d) You must be able to solve linear equations involving complex numbers.
(REALs = REALS, I = I) Practise using 2006, 2005 and 2004 papers. In particular be able to find i^3, i^6, i^7.

Question 5 – APs and GPs

(a) You must know the formulae for the Tn and Sn of an Ap and be able to find a and d using simultaneous equations.
(b) You must know that in all APs T2 - T1 = T3 - T2 = d.
(c) You must be able to find a and d if given Sn.
(d) You must know the formulae for Tn and Sn of a GP.
(e) You must know that in all GPs that T2/T1 = T3/T2 = r. You must be able to find a and r if given two terms of a GP (this is the easiest question on paper 1). Practise papers from 2006 (very good), 2005 and 2004.

The three calculus questions
Question 6 – Periodic Functions and Calculus

(a) You must be able to find the period and range when given the graph of a function.
(b) Calculus – you must be able to find the Max and Min of a cubic function.
(c) Graph – you must be able to sketch the graph of the cubic function in part b for certain values of x. You will use the results of part b to help you draw your graph. (This can be a messy question.) Questions based on the meaning of dy/dx can also be included, such as the slope of a tangent Practise papers from 2006, 2005 and 2004.

Question 7 – Calculus

(a) You must be able to differentiate from first principals (first principals can appear in Q6 or Q8). (b) You must be able to use (i) the product (ii) the quotient and (iii) the chain rules for differentiation.
(c) You must be able to deal with problems involving distance, speed and time using differential calculus. This is the best question on the first paper, totally nail it by practising papers from 2000 to 2007.

Question 8 – Functions and calculus

(a) You must be able to find f (x) given different values for x.
(b) You must be able to solve equations of the form f (x) = a.
(c) You must be able to sketch the graphs of functions of the type f (x) = 1/(x + 3).
Practise using papers from 2007, 2006, 2005 and 2004.

Remember the following points:
(a) Questions do not have to be done in any particular order, do the easiest questions first.

(b) If your algebra is not good use your calculator for all situations involving minus signs, and use the roots formula ($\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$) to solve quadratic equations.
(c) It is essential that you pick your questions carefully.

(d) Know your formulae and write them down as soon as you get into the exam hall .

(e) Do all graphs on graph paper and remember, the best way to scale a graph is to use 10 small squares between each number on the X-axis and five between each number on the Y-axis.

(f) Remember how the marking scheme works (a = 10 marks, b = 20 marks, c = 20 marks).

All questions carry attempt marks, which are awarded for any step taken in the right direction. The attempt marks are usually one-third of the marks for the particular section. Errors are punished as follows:
-1 for a slip (a small arithmetical error)
-3 for a blunder (a more serious technical error or omission)
If an error is repeated in a question it is only punished once (you only lose three marks, not six).
Graphs are marked as follows:
Two marks for each correct couple and one mark for plotting the couple.
In questions involving formula, the formula filled in correctly will get most of the marks. Diagrams are useful and may merit some marks if they show added information not given in the question and constitute a step in the right direction.

Ordinary Level Paper 1

What questions should I do?

The problem with paper one is the lack of "dead cert comes up every year" type questions. This suits nobody except some students who have dropped from higher maths. So what is the best approach? This depends really on your ability in algebra. Read this next bit carefully, it will help you decide which questions to choose

How do I know if my algebra is good?
Ask yourself can you solve
(1) Simultaneous equations – equations of the form $\begin{matrix} 3x + 4y = 10 \\ 5x - 7y = 3 \end{matrix}$
(2) Quadratic Equations – equations of the form $3x^2 - x - 2 = 0$ and get the answer correct every time using factors or the roots formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
But you must get the correct result every time. The important words here are every time.

(3) Solve simultaneous equations of the form $\begin{matrix} x - 3y = 10 \\ x^2 + y^2 = 10 \end{matrix}$

(4) Solve equations of the form $2x^3 + 3x^2 - 5x - 6 = 0$

If the answer is yes to all four questions then Paper 1 will be no problem. You should attempt the following questions for the best result: Q2, Q3, Q4, Q5, Q7, Q6, and, if you have time, try Q1 and Q8. I know most people will tell you to start with Q1, but I believe if you are good at algebra, then you should flaunt it. Getting Q2 and Q3 done will give you great confidence to continue.