HSC Exam Advice – Mathematics (2 Unit)

You are now on the home stretch in regard to your studies in Mathematics. It is nearly the Trials, and the HSC exams are fast approaching. In order to be as prepared as you can be, it is vital that you start preparing now, by getting yourself well organised. So how are you going to best prepare yourself for the Mathematics examination, and how should you sit the exam? Here are some tips to help you prepare best.

Preparing for the Mathematics HSC Examination

- Obviously, your final preparations for Mathematics are a part of your overall study plan. For this you need to plan a study timetable. You may not stick to it rigidly, but that is not the point. In planning your final approach to the HSC, you will develop a realistic view of the available time for each subject, and for each topic within each subject. Instead of making a detailed study plan as to what exactly you will study each day, it is better to make a list of all you need to revise in each subject and then plan which subject to study each day. In one sense, Mathematics is the easiest subject to study for – when you are in “practice paper mode”, you can (as well as sitting entire papers), do a few HSC questions here and there between studying for other subjects.

- It is recommended that you study two subjects per day and that you include all subjects each week and not focus solely on one subject for a whole week at a time. For example, you may study English and Maths one day, Biology and Modern History the next day, Physics and Drama the following day – and then repeat this pattern every three days.

- It is important to keep all subjects going through the holidays. This will however be affected by your exam timetable – if you have a whole week or more between two subjects, you may spend less time on that subject during the holidays, but you should not leave it all to that gap during the exams.

- Be careful to actually learn work in the holidays. Don’t get bogged down making more notes and summaries. That should be completed already. Now is the time to learn, to study, and to commit to memory. Test yourself by writing down points you have learnt or by saying things aloud. Don’t just read through your notes as even repeated reading will not put the facts into your head – you need to learn the fact.

- It is important during the holidays, to get up early in the morning and study from say 9am to 12noon and then 2 – 5pm. This is the same time frame that your body will have to get used to during the exam period and it is not a good idea in the holidays to vary this time frame. So don’t get up late and then study till late at night as then, when the exams start, your body will take a while to readjust to a new time frame. Six hours per day is the minimum that you should study – in a maximum of three hour sessions but it is recommended that you take a short 2 minute break every so often during the

“The only person who is educated is the one who has learned how to learn... and change.” Carl Rogers
three hour session. It is important to remember that repetition is what leads to memory retention – so learn something one day and then the next morning take half an hour at the start of the day to go over what you learnt the previous day. Reward yourself with breaks when you have been working hard. In saying all of this, make sure you work at times that suit you – sitting there for hours when you are achieving nothing doesn’t earn you a medal – if you are getting tired, change location, or take a break and come back soon to continue on with work!

- Learn from the students of years gone by. By visiting www.boardofstudies.nsw.edu.au, you are able to access the comments of the markers from previous year’s exams. It is worth reading, as it provides some helpful information and insights what will assist your completion of the examination.

- Study in all different settings. Alone at home. At a friend’s place. With a few people at the local library. It helps to break the monotony and you often pick up good tips from other students. Remember though, that the objective is to study. If you are able to study in a small group, this can be a wonderful way of improving your understanding of key concepts in the course. Often the questions you can’t answer will be an area of strength for your friend (and vice-versa). Collaborative learning is a great way of consolidating your understanding. If you are the one explaining something to a friend, this will also help you as it allows you to demonstrate your understanding, and in the process you will be encouraged.

- Do the revision sets at the back of each chapter in your text book (or other text books you may have at home – or go to your local library and borrow one). There are many different texts available. Do not worry if you have done the sets before. Chances are it was quite a while ago so these will be worthwhile completing. It allows you to refine your knowledge of each topic. It may also alert you to concepts you forgot to include in your summary.

- Most schools will provide you with Trial HSC papers from other schools. If not, ask your teacher. They will usually be able to provide you with these along with the associated solutions. You could also ask friends from other schools to swap papers with you (i.e. your trial exam) and then you will have more resources to use.

- Don’t be overwhelmed by the amount of work ahead of you. All projects, no matter how complex, may be broken down into simple parts. Keep in mind also, that thousands of students have tread this path before you, and survived!

- For Mathematics – at this stage past exam papers are the best way to practise. Certainly before you start doing past papers, you need to learn your formulae and ensure you know all the set techniques. Books of past HSC papers with solutions are available in bookshops. They will come with a set of suggested solutions for each question. If possible, do the exam at one sitting. One of the most important things to get used to in regard to examination preparation, is ensuring that you learn to manage your time well. The more papers you can complete as part of your preparation, the more comfortable you will be with the style of questioning. So try to do the paper in one go - don’t get up during that time to visit the fridge, to check your mobile etc. In fact, you should do the exam away from your computer and your phone. Do not peep at the answers during this time, don’t look up formulae, just do the exam from start to finish. Try to rehearse your exam technique by leaving questions you can’t do, and come back to them later. If you cannot complete the paper in the set time, draw a line to indicate where you were at the end of the time period, and then continue to the end of the paper. Having completed the paper, you then mark it in red pen. Whenever you get something wrong, copy in the correct working in red pen, trying to understand the worked solution. Past papers can be found on the Board of Studies website: http://www.boardofstudies.nsw.edu.au/hsc_exams/. Useful sources for examination papers include the Success One Mathematics Papers series, and a number of different papers can be sourced from the website http://www.boredofstudies.org/ , where a number of past papers are available for download. Another option is to see if your friends in other schools can send you some other practice papers from their school for you to obtain a copy. The Catholic and Independent trial papers are an excellent source of revision also. Practice makes progress – so go for it!

- Now this is the important part. **DO NOT GO ON TO DO ANOTHER EXAM YET.** The first step is to list all the questions you got wrong, whether it was because you didn’t know the formula or method or because you made errors of algebra or arithmetic. List these questions on a separate piece of paper (e.g. qn1, 7, 11a, 12biii etc). Before completing another paper, redo all these questions again and mark them. This is where the learning and improvement takes place.
• You may find now that you get some of those questions correct but others you still can’t do or get wrong. Keep that list and redo them again at another time until you are able to do all the questions. Then move on to another paper and repeat the process. Don’t underestimate the value of practising repetitively the solution to a particularly tricky question. It is the constant practice that creates the pathway in the brain.

• You may find that a particular topic is causing you trouble. Go to your textbook or class notes and revise that topic before doing another paper.

• If you battle with Mathematics, you may find it more helpful in the beginning to do only questions 1 to 5 of past papers (up to 2011 HSC) until you are getting them right, then move on to questions 6 – 8 etc. Questions 9 and 10 of the Mathematics paper are the most challenging and if you find the subject difficult you should certainly concentrate on getting the earlier questions right rather than spending time battling with the later questions. Of course, in 2012 for the first time the Mathematics HSC examination included multiple choice questions. So Questions 1-10 are each worth 1 mark, and longer questions 11 - 16 are worth 15 marks each. Questions 15 and 16 are equivalent to the old questions 9 and 10. If you are aiming for a Band 6 in this course, then you need to concentrate first of all on getting all the earlier questions correct and eliminating careless errors. Then you concentrate on the later questions in the past papers to develop your problem solving skills. So after doing a couple of full papers, if you find you are coping easily with the first say 7 questions, then concentrate on questions 8,9,10 (or 2012 Q15 and 16) from a number of past papers. The more exposure you can get to the harder questions, the more comfortable you will feel heading into the examination.

• But remember, it is not the quantity of past papers that you do that leads to success. It is the way you mark them and follow up by practising over and over the questions that you find difficult or get wrong. And you must ensure that you can complete the paper in the required time – you will need to work out how long to spend on the earlier part of the paper to allow sufficient time for the last few sections.

• In the Mathematics 2 unit paper, it is essential to know your basic calculus and to be able to differentiate and integrate the different types of functions. This should be something that you know well – all the rules must be learnt and practised regularly.

• Once the HSC exams come nearer, don’t drop your Mathematics to concentrate on only English for example. Do a little Maths each day to keep you mathematical brain ticking. Even 15 minutes each day differentiating and integrating, keeps you on top of it. For example, you can do 2 HSC questions each day for 15 minutes just to keep your hand in.

• The day before the exam, go through the list of questions you have made that are still causing you trouble. Go through all your formulae – write them down, ensure you know them all. Don’t start to do a new paper the night before and don’t try any particularly difficult questions as it may throw you and put you off your stride. Have an early night. On the morning of the exam, glance over your formulae but don’t do any more questions. Don’t congregate with a group of people before the exam and stress over what you know and don’t know – don’t even talk about Maths before the exam. Make sure you have a good breakfast.

Sitting the Mathematics HSC Examination

• You will be given 5 minutes to read at the start of the examination. Please use your reading time wisely. Make mental notes of questions you know are similar to ones you’ve done before. Your brain starts to work on these questions, even before you get to complete your answers. If there are some things that you remember are important, but you think you will forget if you don’t write something down right away, then when writing time starts, how about scribbling down those things quickly on the examination paper. For example, “Product rule”, “2 sides, 2 angles is Sine Rule”, “Pythagoras….”, “Point-gradient formula” etc. – This will allow you do the questions much more quickly when you come back to them. And don’t worry about scribbling on the exam – do whatever will help you later on.
• Another idea is to glance quickly through the early questions but spend more time on the Geometry question, looking to see how to do it. Also read some of the later questions to prepare yourself for them. When actually doing the exam on the day, be mindful of the mark allocation for each part of each question. It can guide you as to the extent of response required. A 2 mark question will generally require at least two significant steps, a 3 mark question, at least three significant steps. Don’t spend pages on a question that is worth only one mark.

• Attempt all questions. “Blanks” always score zero. Often there are many ways to gain marks in questions. Even if you can’t get to the end of a question, you should at least have a go (you might be able to score partial marks for a question).

• Don’t allow yourself to get bogged down on any question, particularly a multiple choice question. Move on and come back to it. This is very important – some of the questions at the end of the MC section involve multiple steps – don’t spend too long on them. Perhaps have a guess (don’t leave it blank – you might not come back to it), and make a note to come back to that question when you have finished the paper. After all, each MC question is only worth 1 mark.

• Check the mode of your calculator. It should be in degree mode for basic numerical trigonometry questions such as bearings, elevation and depression, and equations with the domain given in degrees. However, for any calculus or graphing questions, you would normally expect to use radian mode.

• Never use liquid paper over an answer. Never scribble out an answer. Just put a neat line through it if you have something better to replace it with. However, even crossed out work may well be looked at by the examiner, if it advantages you. The examiners look very hard to try to award marks. However, only valid work is of value. If you redo a question, always ensure that you cross out the incorrect solution. You cannot leave it to the marker to choose which solution is better.

• Draw all diagrams for Coordinate Geometry and Geometry and any other diagrams given. Draw them in pencil, with a ruler and draw them large. Graphs should also be drawn neatly with a pencil and ruler and while they will not need to be to scale, they should be large and all data marked on them.

• Work at a brisk, but careful pace through the first half of the paper (Questions 1-12). Ensure you leave enough time for the more difficult questions coming up later. Don’t spend too long on a question that is causing you trouble – move on. But remember that you may not have time to come back to it.

• Watch your timing in the examination. Time can get away from you quickly. The new format is a little different. 10 Multiple choice questions, and then 6 questions worth 15 marks each. If you are able to complete the Multiple Choice section in about 20 minutes and devote about 20 minutes to each of the Questions 11-16, then you will have 40 minutes at the end of the examination to go back over your work, check your answers, and complete any questions that you were unable to do earlier.

• While we are on checking, many students don’t know how to do this properly. Checking doesn’t just mean putting the answers into the calculator again to see what you got before to see if it is still the same (although this can be a helpful thing to do). Rather, consider checking (if you have time) as an opportunity to go back over the paper with a fresh set of eyes. Here are some things you can be looking for when checking over your work:

  ➢ Checking to see if you have answered the right question – this sounds silly, but especially important in the MC section. The 3 most obvious errors will be the other 3 answers in the 4 options in the question. Ask yourself, “Have I answered the question that was asked” – this can be easily missed when rushing through your work.

  ➢ Checking for decimal places, significant figures, units etc. An additional look through can help to see if you have rounded off to the correct number of decimal places (money questions always 2 decimal places unless they are asking to the nearest dollar), correct units for area (cm² etc.) – easy to overlook but very frustrating to lose marks on a question when you have done most of the hard work on the way through.

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Check if your answer makes sense in the context of the question. For example, when completing a Cosine rule question, see if your final answer for the 3rd side looks right – you may have forgotten to square root the final answer and this could cost you…. Another area where mistakes can be easily made is in the area of Superannuation or Loan Repayments. A quick check of how much money has gone in against the value attained for the final value of an annuity from your calculator using the formula can be a quick check. If the answer sounds wrong, it probably is… There are many other things to look for, but this will get your started.

- If the question asks you to prove or show something i.e. the answer is given, you need to show every step of working. If you are unable to a “show” question, you can always assume the answer and use it in the next part of the question. Don’t give up on a question than because you can’t do the first part. Remember in a question with a number of parts, the early parts are there to help you with the parts that follow – so use the information you have already found.

- Be familiar with the terminology used in the course. Often students can’t answer questions not because they are unable to perform the process, but rather because they didn’t realise what the question wanted them to do. Sometimes using a highlighter or underlining key words in the question can help you to make sure you are headed down the right track. This is especially true with tricky probability and two-way table questions, where one or two words can completely change the direction of a question.

- Make your diagrams a decent size and make sure the axes to any graph you draw are ruled. Diagrams should be at least 1/3 of a page, axes should be labelled, and write the equation of the graph on the number plane. Don’t take too long, but rule straight lines, and work accurately. This is important!

- Show working. Markers constantly remark that students miss out on part marks because little or no working is shown. If you do most of a question right, but show nothing but the final answer and it is not quite right, you will receive no marks for a question. Students have been awarded almost full (and sometimes full) marks on a question when they have showed all of their working along the way. Make sure you do this – communicating your mathematical knowledge is a vital thing.

- Don’t try to judge the value of some minimal response made by you. For example, a locus response by you may well attract a mark, even if your only attempt is to draw its graph (correctly). So, if that is your best (and only) response, then do so. Furthermore, never be embarrassed by your attempt. We examiners have “seen it all”. Be proud of your efforts, even if you would like to do better. This is the diversity of life – and we celebrate this. The more you can show, the better your chances of achieving some marks from the person marking your examination.

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Good luck with your exam preparations! TSFX

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