



Steps to Success in Mathematics (Part 1)

Name: _____

Class: _____

There are a number of things you can do to help yourself achieve good results in Mathematics. Read the following carefully (maybe highlight key points) and rank yourself in each area.

1. BRING ALL EQUIPMENT TO CLASS

If you are a sportsperson, you know that turning up to a soccer match, for example, without things like soccer boots and a soccer ball would severely limit your chances of playing a good game. It is the same for Mathematics. There is specialised equipment that is necessary to make your time in class more effective.

Some of the things you need to bring to class are:

- Textbook!
- Exercise book, workbook or paper.
- Calculator (if your class is currently using calculators).
- Ruler.
- Pen, pencil and eraser.
- Geometric equipment (protractor, compass etc) if relevant to the topic.



Rank yourself. How good are you at bringing all equipment to class?

EXCELLENT VERY GOOD GOOD OK NEED TO IMPROVE

2. BE READY TO START WORK STRAIGHT AWAY

Many students come into class and just sit there chatting while waiting for the teacher to arrive and tell them to open their books before they do anything. The problem with this is that by the time you locate everything and are ready to start, your teacher is probably half-way through the first explanation and you are already beginning to be left behind.

As soon as you enter the classroom, take your books and equipment out and open up to wherever you are up to before you start chatting with your friends. You are now ready to start as soon as the teacher arrives.




Rank yourself. Do you get ready to start work straight away?

ALWAYS MOST OF THE TIME SOMETIMES NOT OFTEN NEVER

3. REALLY LISTEN TO INSTRUCTIONS

Have you ever thought you were sitting there listening but then at the end of the instructions discovered that you had absolutely no idea what you were supposed to be doing in the lesson? It is easy for this happen. Training your mind to listen is a skill that you can learn and develop. It simply requires a bit of effort in the beginning until it becomes a habit to listen rather than just hear. Then it will just happen automatically.


The way to keep your mind focused and prevent day-dreaming is to keep it occupied. You do this by asking yourself questions as opposed to just letting your mind roam free. Develop the habit of questioning as you listen: 'What equipment will I need?', 'Do I understand what we are expected to do?'

 Rank yourself. Do you always know what you are supposed to be doing in class?
ALWAYS MOST OF THE TIME SOMETIMES NOT OFTEN NEVER

4. USE CLASSTIME EFFECTIVELY

There are a number of really good reasons to make the most of classtime. You learn more when you work in class and have the teacher there to ask questions. If you work in class you don't get into trouble, your report comments are positive, but most of all it is just common sense - time you waste in class means time you have to make up at home!


Using class time effectively means staying on task (i.e. doing what you are supposed to be doing) throughout the whole lesson. To improve in this area, in your workbook keep a tally each lesson of how many times you are NOT using your classtime effectively. (Either you will realise yourself or your teacher will point it out to you.) Try and reduce the number of tally marks (and how long you are off task for as well).

 Rank yourself. How effective is your use of classtime?
EXCELLENT VERY GOOD GOOD OK NEED TO IMPROVE

5. CHOOSE CAREFULLY WHO YOU SIT NEXT TO

Of course it is natural to want to sit next to your friends. But just because you are compatible with respect to friendship, does not mean you are compatible as workmates. Some friends work really well together. They keep each other focused and they help out each other when there are problems in understanding the work. Other friends always prove to be a major source of distraction. There are just some people that you will not be able to work well with.

Face reality about the person you sit next to. Are they making it harder for you to do well in Maths? If this is the case, and your teacher has not moved you, simply say: 'Look mate, (you can leave out the 'mate' if you are a girl) I just can't get any work done when I sit next to you! I think we should move seats for awhile'. You can give reasons if you want to like you are falling behind, your parents will freak out at the bad report comments etc. etc. but most likely your friend will just be relieved that one of you admitted it. If you feel the peer pressure is too strong to do this, have a quiet word to your teacher and ask them to move you without giving away that it was your idea. They will be more than willing to help!

 Rank yourself. What effect does the person you sit next to have on your results?
HELPS YOU IMPROVE NO EFFECT MAKES IT HARD FOR YOU TO WORK



Studying for Mathematics Tests (Junior)

Name:

Class:

Follow these steps to prepare for your class tests in Mathematics.

COMPLETE ALL CLASSWORK

If there is work that you have not completed, either worksheets or textbook exercises or any other set homework, your first step is to finish this off as quickly as possible.

SEE YOUR TEACHER ABOUT PROBLEMS

If you are having trouble finishing off work, go and see your teacher about it straight away. Either ask them questions in class if there is time, or ask if you can see them at lunch or before or after school briefly. Don't put it off as you need to fix these issues before you can really start studying.

NOW

LEARN

You need to learn the rules and formulas for the topic. It is important that you understand these, but even so there will probably be the need to memorise some of the rules.

To do this:

- Use flashcards to test yourself with the questions on the front and answers on the back.
- Read through your summaries a few times then have a friend or family member test you.
- Read through your summaries a few times then put them aside and see what you can write out without looking at them.
- Read the rules out loud to yourself.
- Put notes up around the house.

PRACTISE

It is no use knowing formulas if you don't know how to apply them! You need to be able to do all sorts of questions on the topic no matter how they are presented.

To do this:

- Do any chapter reviews at the end of your textbook chapter.
- Do any revision worksheets or past tests that your teacher gives you.
- Go back and redo questions you found hard in the chapter.
- Use other textbooks or books to give you practise with a variety of question types.
- Keep redoing questions you find hard until you can do them.

Keep alternating between 'learning' and 'practising'

MAKING YOUR STUDY MORE EFFECTIVE

Tick whether or not you usually do the following:	YES	NO
<p><i>1. If you come across a question you are having trouble with, do you do the following steps?</i></p> <ul style="list-style-type: none"> • Look through your class notes and summary book and see if there is anything there to help you. • Look for examples that are similar and see if you can understand them and relate them to the question you are doing. • Leave the question after you have spent a bit of time on it and move onto the next question. Come back to the question you are having trouble with later. • See if you can work out how to do the question by looking at the answer. • Ring a friend or see if someone in your family can help you. • Once you have tried a few times, make a note of the question so you can ask your teacher about it the next day. <p>Whatever you do, don't just ignore questions you can't do. If you do that they are sure to be in the test! Doing well in Maths means finding out which questions you can't do then working out how to do them.</p>		
<p><i>2. Do you do enough practise questions when you are preparing for a test?</i></p> <p>Lots of students don't do enough practise for tests. They do one or two questions from each section, then think that they have 'got' it and so don't need to do any more. Doing practise is not just about locating the questions you can't do. It is also about building up your speed and accuracy. The more practise you do, the quicker in a test you can identify what the question is asking and the faster you become at actually doing it. This will help you finish the test without running out of time and allow you to spend more time on the questions that are less straightforward and require more thought.</p>		
<p><i>3. Do you do some of your revision under examination conditions?</i></p> <p>If you have ever had the experience when you thought you knew it all, but found out in the test that you had forgotten much of it, you probably did not do enough practise under examination conditions. Towards the end of your study, you need to start doing questions without looking at your notes or summaries or referring to the answers to see if you really do know how to actually identify question types and do the questions when you are in an examination situation.</p>		
<p><i>4. Do you start your revision early enough?</i></p> <p>Mathematics is not something you can take in all in one night. You need to spread your revision out over as long a period as possible. As soon as you find out about the test, start doing a little bit of work each night or at least reviewing your summary book. You'll remember more from 10 minutes over 5 days than just one 50 minute period.</p>		



Using Calculators in Mathematics

Name: _____

Class: _____

Calculators were first introduced to schools in the late 1970s and have come a long way since then. Every school has a different policy about what types of calculators students can use and when they can start using them.

There are two main types of calculators. Many students are using what is called a scientific calculator. These do more than just the four basic operations allowing you to do calculations involving things like powers, statistics and even logarithms. Usually only certain models are approved by the educational authorities. Graphics calculators are becoming more popular as they have a graphics screen rather than just a numerical display screen and have a lot more functionality allowing students to do things like graph functions and program their calculator for certain mathematical work.

Knowing how to use a calculator properly is essential for success in Mathematics. If you use it incorrectly, it will cost you valuable marks. But if you learn to use the full functionality of your calculator, it becomes a great tool for helping you solve problems with speed and accuracy.

THINGS YOU NEED TO KNOW FOR EFFECTIVE CALCULATOR USE

<i>Tick whether or not you know the following:</i>	<i>YES</i>	<i>NO</i>
1. Do you know whether your calculator is a scientific calculator or a graphics calculator? Do you know if your calculator is programmable? Is your calculator approved for use by your school?		
2. Do you know how to change the batteries on your calculator? Do you know if your calculator gives any warning or indication of low battery?		
3. Do you know how to reset your calculator? For many calculators there is a small hole at the back where you can insert something like an unfolded paper clip and it will reset your calculator. Some schools do this before exams to ensure that anything stored in the memory is wiped. You may find that you need to do this if you encounter a serious problem with your calculator. The important thing to realise though, is that doing this also changes your calculator back to the factory settings. You may need to change some settings (such as radians to degrees for Trigonometry or the scientific notation settings) in order to ensure the answers you are receiving are correct. Do you know what changes (if any) you need to make to ensure your calculator is functioning the right way for you if it is reset?		
4. Do you know what <i>mode</i> your calculator should be in? Do you know how to tell what mode it is in? Do you know how to change modes? Do you even know what modes are? If not, read the guide on the next page. For some topics, if you have your calculator set in the wrong mode, every answer will be wrong even though you entered everything in correctly!		
5. Related to the question above, do you know how to make your calculator round numbers to a certain number of decimal places?		
6. Many students never utilise the 5 minutes it would take to learn how to use the memory functions of their calculator. The new graphics calculators especially have huge potential to make your calculations quicker and more accurate as they allow you to store so many numbers. Students who don't bother to learn how the memory functions on their calculator operate are making it much harder for themselves to achieve good results. Do		

you know how to store, retrieve and use answers in the different types of memory available on your calculator?

7. Try these calculations to make sure that you recognise when to use brackets and whether your calculator has any other quirks you should be careful of.

a) $\frac{3+5}{8} =$ b) $\sqrt{31.7+68.3}$

The correct answers are a) 1 (not 3.625) b) 10 (not 73.93...)
Can you get the correct answers?

8. Do you know if your calculator has a fraction key and/or a button that converts fractions to decimals and vice versa? Can you use them?

9. Do you always check mentally once you have your answer to see if it seems to make sense? For example, if you were doing a calculation that was 6% of 900 and you got an answer of 126, would you check you hadn't made a mistake in entering the numbers? (you can easily work out in your head that 10% would be 90 so how can 6% be more than that?). Many students just copy down the answer without doing a quick estimation to see if their answer makes sense. Do you consider if your answer is sensible?

What if you cannot do these things? You have three options:

- 1) *Read the manual. But this can be quite boring and sometimes hard to follow.*
- 2) *Find someone who has the same calculator as you and knows how to do these things. Have them show you and write down the steps. Practise yourself until it is automatic.*
- 3) *Ask your teacher (although there are so many different calculator types your teacher may also have to find someone who has a similar calculator to work it out for you!).*

MODES:

Although every calculator will be slightly different they usually have similar options for what modes they can be set to. Often you press the mode button once and one set of options appears, press it again and a different set of choices becomes available. Sometimes you have to hold another key down such as the shift key to change modes on your calculator. But what do all these different options mean?

- COMP is the computational mode and is used for general calculations.
- REG is the regression mode and is used for two-variable statistics.
- SD is the standard deviation mode and is used for single-variable statistics.

So if you are not doing statistics (or don't know what stats are!) your calculator should be in *COMP* mode.

- FIX rounds your answer to a certain number of decimal places.
- NORM is the normal display where you see a string a decimal places if applicable.
- SCI shows your answer in scientific notation.

Most students would have their calculator in *NORM* mode unless they want the calculator to round every answer to a certain number of decimal places or present the answer in scientific notation.

- DEG, RAD, GRA

Most calculators have degree, radian, and grad modes ($360^\circ = 2\pi \text{ rad} = 400 \text{ grad}$). It is important to have the calculator in the right mode since that mode setting tells the calculator which units to assume for angles when you are doing Trigonometry. Having the calculator in the wrong mode is a common mistake for beginners. Teachers often tell students to get in the habit of making sure their calculator is in *DEG* mode as it is the mode you will probably use when starting out with trig.

*So most of the time, you would probably go for **COMP, NORM, DEG.***



Studying for Mathematics Tests (Senior)

Name: _____

Class: _____

Topic tests are much more important in the senior years than the junior years. If you think topic tests or assessments are purely for grading purposes, think again. While your teachers do need to use them as a mechanism to grade you, they are actually a useful diagnostic tool for students. Often you think you have mastered a particular concept only to find in a test situation that you did not understand certain sections as well as you would have liked. Tests and assessments along the way allow you to identify what areas you need to work on improving in order to achieve the best result you are capable of in your final examinations.

Steps to achieving a good result in Mathematics tests:

1. GET UP-TO-DATE!

It is the perennial cry of the Mathematics student that you are simply expected to do too much work. But don't blame your teacher. The amount of content that they have to cover is out of their control, this is set by each State's educational authorities. It is usually quite a challenge for teachers and students to try and complete all of the content in the limited time available. It would be great if you were always totally up-to-date and had every piece of homework and all the textbook exercises fully completed at all times. But in the senior years you often end up getting swamped by other subjects at certain times and now and then your Mathematics, a subject that needs regular homework, suffers from this. If you have fallen behind and you have a test looming, make the decision to get up early a few mornings and work on the exercises or sacrifice a few lunchtimes at school in order to get caught up. It is essential that you have fully completed all coursework before starting to try and study the topic. If you are really far behind, you may have to do every second question rather than every question: this isn't ideal but is better than nothing!

**GET
UP-TO-DATE**

**ASK FOR
HELP
QUICKLY
AND
REGULARLY**

2. ASK FOR HELP QUICKLY AND REGULARLY!

Never show up at your teacher's door saying 'I can't do any of this whole chapter'. It is almost impossible to help you if you approach the topic this way. Instead, start at the beginning in your revision and do some exercises. When you get stuck see if you can work it out yourself from the answers or examples, and if not write the question number down and move on - to the next section if you have to! The next day, see your teacher either in class, before school or at lunch and ask them your questions. It will usually only take a few minutes and you can move on in your revision the next night. Many students when stuck don't try and work it out themselves, instead they just stop work and don't even move onto the next section. Or even worse they just skip that bit without asking for help, which of course causes problems in the later sections and the test. Your teacher would much prefer to spend a minute or two helping you now and then rather than have you show up expecting to be re-taught the entire chapter. You have to demonstrate to them that you are putting the effort in as well.

3. MAKE STUDY NOTES

Hopefully you have been doing this throughout the chapter as you go and at this stage are just reading through your study notes to make sure you have included everything you need to know. But if you haven't been doing this, study notes are the first thing you need to do as part of your revision process. Look through the whole chapter and the notes you have made in class and write down the main rules,

theories and proofs that you need to know as well as examples of the different types of questions. Doing this is a fabulous way to start your revision as it forces you to consider everything you need to learn about the topic. It is also necessary to have all the rules and formulas together in one place so you can learn them easily without having to flip through your text or notes to locate them.

MAKE STUDY NOTES

LEARN THE RULES

DO HEAPS OF PRACTISE

To study for Mathematics you need to alternate between learning the content and the rules and practising the skills of the subject. You probably won't spend an equal amount of time doing this. The ratio could be 20% of your time memorising formulae etc and 80% of the time practising question: make sure the practising part is by far the largest component of your study time.

4. LEARN THE RULES

- First of all, it is important to accept that you generally cannot learn and memorise everything you need to know in one night. Your memory needs to see information at intervals with a break between these in order to absorb the information.
- Each day before the test, find at least 10 minutes (while waiting for a bus, when you first wake up in the morning etc) to review your study notes.
- When reviewing your study notes, read through a page or section at a time then close your eyes and either mentally or out loud repeat to yourself what you have just read.
- At the end of your session, close your notes, take out a piece of paper and see what you can write down without looking.
- Test yourself with flashcards, put rules up around the house, have someone test you.

5. DO HEAPS AND HEAPS OF PRACTISE

- Many students spend too little time actually practising questions for the subject. They make the mistake of just reading through their summaries and assuming that they can do the questions without any problems.
- The more practise you do, the better your results will be, provided that you do the following when practising:
 - as you do more practise, refer less and less to your study notes and try and do questions solely yourself (under exam conditions)
 - always check the answers and redo any questions you got wrong
 - you might like to make a list of difficult questions to redo again at a later date
 - if there are questions you cannot do, don't just leave them! Ask for help ASAP
 - buy extra books so you can try different question types