EXAMINER TIPS for IGCSE Mathematics 0580

How to use these tips

These tips highlight some common mistakes made by students. They are collected under various subheadings to help you when you revise a particular topic.

General Advice
- The question papers assume that you will have all the **equipment** listed on the front cover. Make sure that you have all the items on this list the day before you go into the examination.
- Be aware of which formulae you will be given and which you will need to learn before the exam
- Make sure that your **calculator** is set to degree (deg) mode before you enter the examination.
- In reading **graph** questions it is very important that you make sure that you are reading the scales correctly. The horizontal and vertical axes may be scaled differently.
- If you are drawing a graph then you will need to plot points to within 1 mm and if the points lie on a **curve**, you need to join them with a **smooth freehand curve**. You should not join points on a curve with a series of straight lines. If the points lie on a **straight line**, however, then it is important to use a **ruler** to join them
- A minimum of three figure **accuracy** is required in questions where no accuracy is specified. In money questions answers to two decimal places are required.
- To achieve three figure **accuracy** in your answer you need to have at least <u>four</u> figures in your working. Best advice is to use the full calculator display throughout your working
- On the papers where you write your answer on the question paper, it is not acceptable to give a **choice** of answers on the answer line. Examiners will mark the worst answer in these cases.
- In **construction** questions you are expected to be able to find a locus using just a pair of compasses and a straight edge. Compass arcs showing your construction method are required so do not rub them out – they are an important part of your working.
- Diagrams in questions having 'not to scale' written by them usually require a calculation. Do not use these **diagrams** to take measurements from. If a triangle is right angled, isosceles or equilateral then the question will say so either specifically or by giving information about the edges or angles.
- You need to be careful with the use of the **division** symbol. In algebra questions a + b/2 is not the same thing as $\dfrac{a+b}{2}$. The division line must cover everything that is to be divided by 2. The alternative is to use brackets to make your answer clear, as in (a + b)/2.
- You need to be careful with the use of the **square root** symbol. $\dfrac{\sqrt{x+2}}{3}$ is not the same thing as $\sqrt{\dfrac{x+2}{3}}$ The symbol must cover everything that needs to be square rooted.

- In **probability** questions answers should be given in fractions or decimals. Answers in ratio form or in words are NOT acceptable. If you work with decimals or percentages then the 3 figure accuracy rule applies as well
- The question papers are set so that you have time to finish them and check your answers. It is important that you **read the question** carefully and not make instant assumptions about what you are being asked to do
- You are advised to show **working** as well as solutions as marks are awarded for the working even when answers may be incorrect. Marks are given for the work that you do correctly, not subtracted for the work that you get wrong

Paper 1 Tips

- A basic feature of **algebra** is that multiplication signs are unnecessary - bc means b multiplied by c.
- Questions which have **bold type** in them are giving a hint to take special care
- If you are asked to **estimate** the size of a number then only 1 significant figure is usually required.
- A question that says **factorise** will require you to rewrite the expression using brackets
- Write as a fraction in its **lowest terms** means that you must cancel down the fraction as far as possible
- In questions about the order of **rotational symmetry** you must give an answer which is a number. Answers in degrees will not be accepted.
- In **fraction** questions that have **show all your working** included, means that the question must NOT be done on the calculator. A correct answer with no working will not score any marks
- When rounding numbers to a given number of **significant figures**, some zeros count and some do not. Please note that 0.564 is rounded to 3 sf and 5.60 is also rounded to 3 sf.
- In questions on **time**
    a. In the 24 hour clock system answers cannot be bigger than 2400. 2415 must be written as 0015.
    b. You must be very careful with decimal amounts of time. 7 hours 30 minutes is NOT written as 7.3hours. The correct value would be 7.5 hours as $30 \div 60 = 0.5$
    c. Answers in the 12 hour clock system must have am or pm included

Paper 2 Tips

- You should read all the **Paper 1 Tips** as any of these topics could appear on paper 2
- When **angles or lines** have to be drawn or measured examiners expect them to be accurate to within 2 mm and 2°. Marks are often not awarded because of poor accuracy.
- Answers to **bearing** questions should always be given as 3 figure answers such as 078° or 265°
- There is a newer topic in the syllabus called **Compound Interest** and this is quite different to Simple Interest. Your teacher will explain the difference. Care is needed because the questions can look very similar.
- When you are asked to draw a **locus** you must ensure that it is drawn long enough to answer the question. For example, the locus of all the points <u>inside</u> a shape must reach the edges of the shape.
- When a question requires an answer in **standard form** then a particular expression is required. An example of this is 6.23×10^8, you should note that
    - the multiplication symbol and the 10 are essential,
    - the first number must have a decimal point after the first digit or else only one digit
    - no other forms of this such as 6.2310^8 are allowed.
- You should be careful to check whether a **travel graph** question is a distance-time graph or a speed-time graph as the methods needed in each are very different

Paper 3 Tips

- You should read all the **Paper 1 Tips** as any of these topics could appear on paper 3. You may also find some of the Paper 2 Tips useful as some of your topics can appear on paper 2.
- Questions on this paper are written to test your understanding of Mathematics and parts of questions will depend on previous parts of the question. You must be careful that you are using any formula you have learnt appropriately.
- When you plot points for a **graph**
    1. the points may not always be on a line on the grid
    2. points on straight line must be joined with a ruler
    3. if you find one point that you have plotted does not lie on your line or curve, go back to your table and check your calculations. Do NOT make your line or curve fit that odd point.
- It is essential in many questions that you should know how your calculator will do calculations. For example, finding the **median of an even number** of values will require you to calculate sums such as $\frac{48 + 50}{2}$ and it is possible that your calculator will give an answer of 73 if you are not using it correctly. The correct answer is 49
- **Parts of questions** are often connected. If you find an answer is unreasonable then it is likely that you made a mistake in an earlier answer that you have then used. You should have time to go back and check your earlier work.
- In questions with mixed **units**, you should usually convert all the quantities to the unit required in the answer before starting to do the questions
- Do not give column **vector** answers as a row. (3 1) in not acceptable for $\begin{bmatrix} 3 \\ 1 \end{bmatrix}$

Paper 4 Tips

- You should read all the **Paper 1, 2 and 3 Tips** as any of these topics could appear on paper 4
- There is a lot of information in each question and it is even more important here that you **read the question** carefully, use the numbers given and answer the question that has been written on the question paper as a large number of marks are awarded in each question.
- This is the only paper where you do not yet answer on the question paper. It is very important that you **set your work out clearly** so that the examiner is able to read what you have written. **Do not** write answers to different questions side by side or put any work on the question paper. It is particularly important that you show ALL your working otherwise you may be awarded very few marks.
    - In **cumulative frequency** graphs the top of the graph and the top of the vertical scale are not always the same number. You need to use the number from the top of the graph in your calculations. If you are in doubt about which axis to read your answer from, then look at the labels on the axes, they will match the units or quantity given in the question.
    - When asked to **describe transformations** make sure that you are using the correct terms. Examiners will not mind if you cannot spell the word correctly but you must use the correct words.
        1. If the correct term is **rotation** then you should give the centre as a coordinate and the angle of rotation with a direction
        2. If the correct term is **reflection** then you should give the equation of the mirror line
        3. If the correct term is **translation** then you should say how much it moves in each direction – use a column vector to do this
        4. If the correct term is an **enlargement** then you should give the centre as a coordinate and scale factor
        5. If the correct term is a **stretch** then you should give the direction and scale factor.

6. If the correct term is a **shear** then you should give the shear factor and the invariant line.

- Most **graphs** are well behaved, smooth and do not do unexpected things. In particular <u>all</u> quadratic graphs with a formula such as $y = 2x^2 - 3x - 4$ have the same shape whatever the numbers in the formula. They are just in different places on the grid.

- If you asked to solve a **quadratic equation** and give the answer to **two decimal places** then this is a clue that the quadratic formula is needed. This is a formula that you need to learn. If no accuracy is mentioned in the question then it will usually factorise.

- In **probability** questions be very careful with the reading of the question – sometimes things are replaced and sometimes they are not.

- In questions where you are asked to **show or verify** a particular result or answer, it is very important that you do not use that answer or result as part of your working. Your working will need to show how the answer is arrived at.

- Units for answers are not provided in the answer spaces and you will not be penalised for not including units with your answers unless the question specifically requires them.

About the Examiner – Simon Bullock

Simon Bullock has been an examiner, trainer and writer with UCLES and CIE for 18 years marking IGCSE. He is the Principal Examiner for Paper 4. As well as examining Simon has been teaching Mathematics in the UK for over 20 years. He is currently Head of Mathematics at a large 11-18 school.