

A Level Mathematics

Induction and Summer Work



EQUIPMENT CHECKLIST – every lesson

Please bring the following items of equipment with you to your first maths lesson. We will check that you have the correct equipment each week and if you do not you may be sent away to get them. You will need as a minimum:

- Black pen (more than one)
- Pencil
- Ruler
- Rubber
- Sharpener
- Pencil case
- A4 lined paper (squared is better)
- Ring binder (lever arch file preferred)
- Scientific calculator – It is now a course requirement that you use a specific calculator for A Level Maths. You will need to purchase the **CASIO fx-991EX** in the first few weeks of the term. Tesco and Amazon are currently the cheapest places to buy this model.

MATHEMATICS SKILLS ASSESSMENT – completed before enrolment in August

Be aware that you will be required to complete the induction test (if you have not already done so) before enrolment. The test will be 1 hour long and is made up of higher level GCSE Maths questions. The topics will include:

- **Algebra** – surds, indices, fractions, expanding, factoring
- **Equations** – solving, rearranging, functions, simultaneous
- **Graphs** – linear, quadratic

Much of the early work you will do at A Level relies heavily on these fundamental topics so it is important that you are able to cope with them. We expect students to be able to successfully complete at least 70% of the assessment.

SUMMER WORK – to be bought to the first maths lesson in September

Follow the link below which will take you to the work we would like you to complete over the summer break in preparation for your A Level studies. <https://tinyurl.com/4r7mv7bk>

- Download and try the example questions for each chapter (only do chapters 1, 2, 3 and 5).
- If you're not sure or want to check your solutions, watch the video that corresponds to that example (e.g. for Example 1, watch Example 1 video).
- When you have tried the example question and watched the video, try the practice questions to help consolidate the skill and concept.
- Do this for all the examples in the chapter and then try the End of Chapter exam questions.

On the next page is a completion tracker so you can record your progress. This needs to be brought along to your first maths lesson in September. Intervention and extra support will be set up for those who have weak areas.

FINAL WORD – from the Barnsley Sixth Form College maths team

Best of luck with your GCSE results in August and we look forward to welcoming you in September. If you have any questions, please contact me, Lane Stephenson (Course Leader for Mathematics and Further Mathematics) at l.stephenson@barnsley.ac.uk

Chapter	Example number and Topic	I was fine on this topic.	I got help on this topic and now it's OK.	I still have a problem with this topic.	
1. Algebraic Expressions	Ex1. Simplifying expressions				
	Ex3. Simplifying fractions				
	Ex4. Expanding double brackets				
	Ex5. Expanding trinomials				
	Ex7. Factorising quadratics				
	Ex9. Simplifying indices				
	Ex10. Fractional indices				
	Ex11. Problem solving				
	Ex12. Simplifying surds				
	Ex13. Expanding brackets and surds				
	Ex14. Rationalising the denominator				
	End of chapter exam questions				
	2. Quadratics	Ex1. Solving quadratic equations			
		Ex2. Solving quadratic equations without factorising			
Ex3. Quadratic formula to solve quadratic equations					
Ex4. Completing the square					
Ex5. Completing the square in the form $p(x+q)^2 + r$					
Ex6. Solving quadratics by completing the square					
Ex7. Solving quadratic equations					
Ex8. Substituting into functions					
Ex9. Finding roots using functions					
Ex10. Finding roots using functions					
Ex11. Sketching quadratics					
Ex12. Sketching quadratics without roots					
Ex13. The discriminant: two equal roots					
Ex14. The discriminant: two distinct roots					
Ex15. Modelling using quadratics					
End of chapter exam questions					
3. Equations and Inequalities	Ex1. Solving linear simultaneous equations by elimination				
	Ex3. Solving linear simultaneous equations by substitution				
	Ex4. Linear simultaneous equations on graphs				
	Ex5. Non-linear simultaneous equations on graphs				
	Ex6. Non-linear simultaneous equations on graphs				
	Ex7. Linear inequalities				
	Ex8. Linear inequalities				
	Ex9. Quadratic inequalities				
	Ex10. Quadratic inequalities				
	Ex11. Non-linear inequalities				
	Ex12. Inequalities and simultaneous equations				
	Ex13. Linear inequalities and regions on graphs				
	Ex14. Non-linear inequalities and regions on graphs				
	End of chapter exam questions				
5. Straight line graphs	Ex1. Work out gradient given two points				
	Ex2. Calculations with gradients				
	Ex3. Alternative forms of straight line equations				
	Ex4. Alternative forms of straight line equations				
	Ex5. Intersections with axes				
	Ex6. Finding the equations of a straight line				
	Ex7. Finding the equations of a straight line				
	Ex8. Finding the equations of a straight line				
	Ex9. Finding the equations of a straight line				
	Ex10. Equations of perpendicular lines				
	Ex11. Testing for perpendicularity or parallelism				
	Ex12. Finding the equations of perpendicular lines				
	Ex13. Working out the distance between two points				
	Ex14. Working out distances and areas				
	Ex15. Modelling using straight lines				
End of chapter exam questions					