OPGS MATHS DEPARTMENT: YEAR 12 INDUCTION

When you start your mathematics A-Level, you will notice that the first 5 chapters include a great deal of content that you would have already met at GCSE.

As such, you need to spend the summer revising these topics in preparation for a quick start to the course in September. You should print off the accompanying booklet and work through it in the order in which you will face them at the start of year 12. (i.e. do not systematically work through the booklet in page order)

Use the website www.vle.mathswatch.co.uk (username: y12induction@opgs, password: triangle) or/ and use the YouTube clips (there are many available on the internet) to help you research on how to complete the questions in the induction booklet. All questions need to be attempted to ensure that you understand the topic thoroughly. The answers are given at the back of the booklet. You will need to mark your work in the booklet and it will be checked by your teacher during the first lesson in September. You also need to fill in the self-assessment checklist to identify areas of strength and weakness.

Title of Tasks	**Purpose of Task:**	**Time to be taken**	**Outcome Expected**
Task 1-6: Getting year 12 off to a flyer	Revision of material that is covered at GCSE and at A-Level	10 hours (roughly 2 hours per task) Task 6 is self-assessment	Students well prepared for the start of year 12 and prepared for baseline test. Students identify their strengths and weaknesses of first 5 chapters of year 12 content
Task 7: Algebraic expressions assignment	Answering questions on the first AL pure topic and students becoming familiar with the assignment setup in the maths department	50 minutes (ignore time the sheet gives)	A completed assignment that a student has picked for their level. All method shown and neatly presented.
Task 8: Graphs investigation	Students to use graphing website to investigate various types of graph, what they look like and why. This is part of the earlier material that students will face in year 12 (chapter 4)	2-3 hours	Investigation complete and students will be well versed in what particular graphs look like. Students will be able to sketch graphs and use algebraic techniques to identify important coordinates that lie on the graph.
Task 9: Sample baseline test	Students to revise for year 12 baseline by attempting an example paper.	1 hour	Completed test. Marked and corrected and any areas of concern flagged up and further research/ revision undertaken to fill gaps.
Task 10: Sampling	Make notes and answering questions on the first applied maths topic	3 hours	Students to understand the data collection process in preparation for the start of their statistics course

Task 1: Chapter 1 – algebraic expressions

Topic	Induction Booklet ref	Mathswatch clip number	YouTube clip URL	☺	😐	☹
Index laws	1.3	154, 188 131, 154, 188	http://www.youtube.com/watch?v=AB3ARY9V0Cw https://www.youtube.com/watch?v=n52RwHdHhM8			
Expanding brackets	1.1	93, 134	https://www.youtube.com/watch?v=hpGWqLSKFMQ			
Factorising	1.2	94, 192	https://www.youtube.com/watch?v=VZBB17HJ7XU			
Algebraic fractions	1.4	210	https://www.youtube.com/watch?v=WAmTNO2hNcY			
Surds	3.1,3.2	207	http://www.youtube.com/watch?v=ifJyCfSGm1M http://www.youtube.com/watch?v=xehwCkT5aX0			

Task 2: Chapter 2 – Quadratics

Topic	Induction Booklet ref	Mathswatch clip number	YouTube clip URL	☺	😐	☹
Factorising to solve quadratics	4.1	157, 192	http://www.youtube.com/watch?v=gJMNt9BAKqM			
Quadratic formula	4.3	191	http://www.youtube.com/watch?v=3ayhvAI3IeY			
Completing the square	1.5, 4.2	209	http://www.youtube.com/watch?v=xGOQYTo9AKY http://www.youtube.com/watch?v=Lrx9o0eVjtw			

Task 3: Chapter 3 – Equations and inequalities

Topic	Induction Booklet ref	Mathswatch clip number	YouTube clip URL	☺	😐	☹
Simultaneous equations	5.1, 5.2, 5.3	140, 162, 211	https://www.youtube.com/watch?v=SZ4x-HzhaKo			
Solving linear inequalities	10.1	139	http://www.youtube.com/watch?v=0X-bMeIN53I			
Quadratic inequalities	10.2	212	https://www.youtube.com/watch?v=k5nw5pGpbGc			
Graphical inequalities	10.3	198	https://www.youtube.com/watch?v=mbMEJyPunNc			

Task 4: Chapter 4 – graphs and transformations

Topic	Induction Booklet ref	Mathswatch clip number	YouTube clip URL	☺	😐	☹
Graph transformations	7.1 7.2	196	http://www.youtube.com/watch?v=5QFloIh_RbE			

Task 5: Chapter 5 – straight line graphs

Topic	Induction Booklet ref	Mathswatch clip number	YouTube clip URL	☺	😐	☹
The equation of a line	8.1	159a,b	https://www.youtube.com/watch?v=oqzURxhYuTU			
Parallel and perpendicular lines	8.2	208	https://www.youtube.com/watch?v=hw5jNfAKOIo			

Task 6: Mark your work and fill in your self-assessment sheet

Task 7: Complete the first A-Level assignment: algebraic expressions (password to open documents: zz2ghc4)
These are differentiated into three levels: "fundamentals", "challenge" and "expert". COMPLETE JUST ONE. Pick the assignment that you think best suits your level (bear in mind that the maximum grade for each level is C, B, A* respectively). This needs to be completed on lined paper and handed in to your pure maths teacher first lesson back.

Task 8: Investigating types of graph

Using Desmos.com you need to investigate various different types of graphs, their shapes and the reason why they have this particular shape. Print off the document "investigating graphs" and work through the research tasks on the sheet.

Task 9: Complete the sample baseline test. Use the website links for help and for self-assessment

Task 10:

a) Make notes on data collection on lined paper.
Use chapter 1 in your textbook (copy attached) and the PowerPoint “Data collection” (also attached) and the internet.
b) Answer exercises 1A, B, C, D from your textbook and mark.
c) Sampling assignment. Print off from Moodle and complete.