Queen Elizabeth's Grammar School

Mathematics Faculty

This is the order in which we will be teaching the Pure content of the Maths A-Level in Year 12.

You should bring all work related to the current unit to each lesson, but once the unit is complete this can be transferred to files at home. Your teacher may ask to see these folders periodically, so make sure they're up-to-date and neatly divided by topic etc. You should store all your class notes and examples, as well as your own self-marked class and independent work. Teacher marked work, tests and assessments should also be carefully stored.

Each unit has several identified independent tasks (for example mymaths or Solomon sheets). You can find the Solomon sheets on Google Classroom, and your teacher will let you know your mymaths login. Your teacher will check that you are keeping up with these tasks.

Students are also expected to complete any exercises started in lessons.

The Pure content will mainly be delivered by one teacher (you will have 6 periods a fortnight with your Pure Maths teacher). However, the course begins with both teachers (Pure and Applied) delivering pure content for the first two weeks (until the initial assessment). The applied teacher will also deliver the vectors units from the pure course.

There will also be independent work and folder checks on the Applied side of the course.

Year 12

Pure Content:

- [Unit 1](#) (Textbook chapters 1-4): Algebra and Functions
- [Unit 2](#) (Textbook chapters 5-6): Coordinate Geometry in the (x,y) Plane
- [Unit 3](#) (Textbook chapters 7-8): Further Algebra
- [Unit 4](#) (Textbook chapters 9-10): Trigonometry
- Unit 5 (Textbook chapter 11): Vectors (delivered by Applied teacher)
- [Unit 6](#) (Textbook chapter 12): Differentiation
- [Unit 7](#) (Textbook chapter 13): Integration
- [Unit 8](#) (Textbook chapter 14): Exponentials and Logarithms

Summer Task - not taught in lessons

The independent tasks are included for those students who need extra preparation on these topics.

Textbook Ref	Detail	Independent Resources
Unit 1 - Algebra and Functions		
1.1 P2 Ex1A P3	Index laws	Mymaths - pure - algebra - indices1
1.2 P4 Ex1B P5	Expanding brackets Binomials and trinomials	Solomon C1 Algebra Worksheet D Mymaths - pure - algebra - algebraic manipulation
1.3 P6 Ex1C P8	Factorising	Mymaths - pure - algebra - factorising quadratics
1.4 P9 Ex1D P11	Negative and fractional indices	Mymaths - pure - algebra - indices 2 Mymaths - pure - algebra - indices 3 Solomon C1 Algebra Worksheet B
1.5 P12 Ex1E P13	Surds	Mymaths - pure - algebra - surds 1
1.6 P13 Ex1F P15	Rationalising denominators	Mymaths - pure - algebra - surds 2

		Mymaths - pure - algebra - surds 3 Solomon C1 Algebra Worksheet A
		Mixed Exercise 1 P15 Solomon C1 Algebra Worksheet C

2.1 P19
 Ex2A P20
 	
 Ex2B P21
	Solving Quadratic Equations
	    By factorisation
	
	    By formula
		Mymaths - pure - algebra - factorising quadratics
		
		 Mymaths - pure - algebra - quadratic formula
		
		 Mymaths - pure - algebra - solving quadratics
		
		 Solomon C1 Algebra Worksheet E

2.2 P22 Ex2C P23 Ex2D P24	Completing the square Solving by completing the square	Mymaths - pure - algebra - completing the square Solomon C1 Algebra Worksheet F
2.3 P25 Ex2E P26	Functions	Mymaths - pure - functions - function notation Solomon C3 Functions Worksheet A
2.4 P27 Ex2F P30	Quadratic graphs	Mymaths - pure - functions - quadratic graphs 1
Initial Assessment		

2.5 P30 Ex2G P32	The discriminant	Mymaths - pure - functions - quadratic graphs 2 Solomon C1 Algebra Worksheet G Solomon C1 Algebra Worksheet H
2.6 P32 Ex2H P34	Modelling with quadratics	
		Mixed Exercise 2 P35
3.1 P39 Ex3A P40	Linear simultaneous equations	

3.2 P41
Ex3B P41
 	
3.3 P42
Ex3C P45
	Quadratic simultaneous equations
	
	Simultaneous equations on graphs
	    Use of discriminant to determine
	    number of solutions
		Mymaths - pure - algebra - intersecting lines and curves 1
		
		Mymaths - pure - algebra - intersecting lines and curves 2
		
		Solomon C1 Algebra Worksheet I

3.4 P46 Ex3D P47 3.5 P48 Ex3E P50 3.6 P51 Ex3F P52	Linear inequalities Quadratic inequalities Including set notation Inequalities on graphs	Mymaths - pure - algebra - linear inequalities Mymaths - pure - algebra - quadratic inequalities Solomon C1 Algebra Worksheet J

3.7 P53 Ex3G P55	Regions	
		Mixed Exercise 3 P56 Solomon C1 Algebra Worksheets K, L, M and N
4.1 P60 Ex4A P62 4.2 P64 Ex4B P65	Cubic graphs Quartic graphs	Solomon C1 Graphs of functions Worksheet A
4.3 P66 Ex4C P67	Reciprocal graphs	Mymaths - pure - functions - sketching graphs Mymaths - pure - functions - sketching polynomials
4.4 P68 Ex4D P69	Points of intersection	

4.5 P71
Ex4E P74
 	
4.6 P75
Ex4F P78
 	
4.7 P79
Ex4G P80
	Translating graphs
	  $y = f(x) + a$
	  $y = f(x + a)$
	
	Stretching graphs
	  $y = -f(x)$ $y = f(-x)$
	  $y = af(x)$ $y = f(ax)$
	
	Transforming functions
		Mymaths - pure - functions - transforming graphs 1
		
		Solomon C1 Graphs of functions Worksheet B, C

		Mixed Exercise 4 P82

Unit 2 - Coordinate Geometry in the (x,y) Plane

5.1 P90 Ex5A P90	$y=mx+c$	Mymaths - pure - coordinate geometry - $y=mx+c$
Ex5B P92		Mymaths - pure - coordinate geometry - gradients
5.2 P93 Ex5C P94	$(y-y_1)=m(x-x_1)$	Mymaths - pure - coordinate geometry - equation of a line
Ex5D P96		Solomon C1 Coordinate Geometry Worksheet A
5.3 P97 Ex5E P97	Parallel and perpendicular lines Parallel	Solomon C1 Coordinate Geometry Worksheet B
Ex5F P99	Perpendicular	
5.4 P100 Ex5G P102	Length and Area	
5.5 P103 Ex5H P106	Modelling with straight lines	Mymaths - pure - coordinate geometry - intersecting lines
		Mixed Exercise 5 P108

6.1 P114
Ex6A P115
 	
Ex6B P116
	Midpoints and perpendicular bisectors
	  Midpoints
	
	   Equations of perpendicular
	   bisectors
		Mymaths - pure - coordinate geometry -
		midpoints
		
		Solomon C1 Coordinate Geometry Worksheets C
		and D

6.2 P117 Ex6C P119	Equations of a circle	Mymaths - pure - coordinate geometry - equations of circles
6.3 P121 Ex6D P122	Intersections of straight lines and circles	
6.4 P123 Ex6E P126 6.5 P128 Ex6F P131	Use tangent and chord properties Circles and triangles	Mymaths - pure - coordinate geometry - circle geometry Solomon C2 Coordinate Geometry Worksheets A, B and C
		Mixed Exercise 6 P132

Unit 3 - Further Algebra

7.1 P138 Ex7A P138	Algebraic fractions	
7.1 P139 Ex7B P141 7.3 P143 Ex7C P145	Dividing polynomials The factor theorem	Mymaths - pure - algebra - dividing polynomials 1 Mymaths - pure - algebra - dividing polynomials 2 Solomon C2 Algebra Worksheets A and B
7.4 P146 Ex7D P149 7.5 P150 Ex7E P152	Mathematical proof Methods of proof	Solomon C3 Proof Worksheets A and B
		Mixed Exercise 7 P154
8.1 P159 Ex8A P160 8.2 P161 Ex8B P162 8.3 P163 Ex8C P164	Pascal's Triangle Factorial notation Binomial expansion	

8.4 P165 Ex8D P166	Solving binomial problems	Mymaths - pure - sequences and series - binomial expansion 1
8.5 P167 Ex8E P168	Binomial estimation	Solomon C2 Sequences and Series Worksheets C and D
		Mixed Exercise 8 P169

Unit 4 - Trigonometry

9.1 P174 Ex9A P177	The cosine rule	Mymaths - pure - trigonometry - the cosine rule
9.2 P179 Ex9B P181	The sine rule	Mymaths - pure - trigonometry - the sine rule
Ex9C P184	Ambiguous case of the sine rule	
9.3 P185 Ex9D P186	Areas of triangles	Solomon C2 Trigonometry Worksheet B
9.4 P187 Ex9E P189	Solving triangle problems	

9.5 P192 Ex9F P194	Graphs of sine, cosine and tangent	Mymaths - pure - trigonometry - sine and cosine graphs
9.6 P194 Ex9G P197	Transforming trig graphs	Mymaths - pure - trigonometry - tangent graphs
		Mymaths - pure - trigonometry - transforming trig graphs
		Mixed Exercise 9 P198
10.1 P203 Ex10A P207	Angles in all four quadrants	
10.2 P208 Ex10B P209	Exact values of trigonometrical ratios	Solomon C2 Trigonometry Worksheet D NOT Q4 or Q12
10.3 P209 Ex10C P211	Trigonometric identities	
10.4 P213 Ex10D P215	Simple trigonometric equations	Mymaths - pure - trigonometry - trigonometric equations 2
10.5 P217 Ex10E P218	Harder trigonometric equations	Solomon C2 Trigonometry Worksheet E NOT Q4 or Q7
10.6 P219 Ex10F P221	Equations and identities	Solomon C2 Trigonometry Worksheet F NOT Q4, Q6b or Q7
		Mixed Exercise 10 P222

Unit 6 - Differentiation

12.1 P256 Ex12A P258 12.2 P259 Ex12B P261 12.3 P262 Ex12C P263 12.4 P264 Ex12D P265	Gradients of curves Differentiating x^n Differentiating quadratics	 Mymaths - pure - differentiation - gradient of a tangent Solomon C1 Differentiation Worksheet A
12.5 P266 Ex12E P267	Differentiating functions with two or more terms	Mymaths - pure - differentiation -differentiating polynomials Solomon C1 Differentiation Worksheet B
12.6 P268 Ex12F P269 12.7 P270 Ex12G P271	Gradients, tangents and normals Increasing and decreasing functions Short exercise	Mymaths - pure - differentiation -tangents and normals Solomon C1 Differentiation Worksheets C and D
12.8 P271 Ex12H P272 12.9 P273 Ex12I P276	Second order derivatives Stationary Points	Mymaths - pure - differentiation - maxima and minima Solomon C2 Differentiation Worksheet A

12.10 P277 Ex12J P278	Sketching gradient functions	Mymaths - pure - differentiation - sketching the gradient function
12.11 P279 Ex12K P281	Modelling with differentiation	Solomon C2 Differentiation Worksheets B and C

Solomon C2 Differentiation Worksheet D (Not Q4) |
| | | Mixed exercise 12 P282 |

Unit 7 - Integration

13.1 P288 Ex13A P289	Integrating x^n	Mymaths - pure - integration - introduction to integration
13.2 P290 Ex13B P291	Indefinite integrals	Solomon C1 Integration Worksheet A
13.3 P293 Ex13C P294	Finding functions	Mymaths - pure - integration - particular solutions

Solomon C1 Integration Worksheets B and C |
| 13.4 P295 Ex13D P297 | Definite integrals | |

13.5 P297 Ex13E P299	Areas under curves	Mymaths - pure - integration - area under a curve
13.6 P300 Ex13F P301	Areas under the x-axis	Mymaths - pure - integration - areas under the x-axis
13.7 P302 Ex13G P304	Areas between curves and lines	Mymaths - pure - integration - area between a line and a curve Solomon C2 Integration Worksheet A
		Mixed exercise 13 P306

	Unit 8 - Exponentials and Logarithms	
14.1 P312 Ex14A P313	Exponential Functions	Mymaths - pure - exponentials and logarithms - exponential graphs
14.2 P314 Ex14B P316	$y=e^x$	Mymaths - pure - exponentials and logarithms - exponential function
14.3 P317 Ex14C P318	Exponential modelling	
14.4 P319 Ex14D P320	Logarithms	Solomon C2 Exponentials and Logarithms Worksheet A
14.5 P321 Ex14E P323	Laws of logarithms	Mymaths - pure - exponentials and logarithms - laws of logarithms

14.6 P324 Ex14F P325	Solving equations using logarithms	Mymaths - pure - exponentials and logarithms - logarithmic equations

14.7 P326 Ex14G P327	Working with natural logarithms
	    Graph of y=ln x
	    Solving eqns involving e and ln.
		Solomon C2 Exponentials and Logarithms Worksheets B, C and D
		
		Solomon C3 Functions Worksheets B and C
		
		Solomon C3 Exponentials and Logarithms Worksheets A and B
		
		Mymaths - pure - exponentials and logarithms - the natural log

14.8 P328 Ex14H P331	Logarithms and non-linear graphs	Mymaths - pure - exponentials and logarithms - growth and decay Mymaths - pure - exponentials and logarithms - logarithmic graphs
		Mixed Exercise 14 P334
		Review Exercise 3 P338