

Year 9 Delta Mathematics 2018-2019



This booklet lists every objective you will cover this year.

To keep track of how well you have done, you need to self-assess your understanding of each objective once you have learnt it in lesson or practiced it for homework.




You should also use this booklet as a revision guide to help you prepare for your three termly assessments this year. Your assessments will be on the following dates:

Assessment	Units to be covered	Approximate date
Autumn	1 & 2	Between 12/11 and 28/11
Spring	3 - 6	Between 04/03 and 20/03
End of year	1 - 9	Between 03/06 and 14/06




Tips for revision

- Pick an objective that you did not understand. Eg. You ticked ☹️ or 😐
- Watch the mathswatch clip associated with this objective, pausing to answer the in clip questions
- Answer some interactive questions on mathswatch to get instant feedback
- Repeat this process
- Ask other students in your form
- Attend maths drop-in sessions




Unit 1 – Powers and roots

	Objective	Strand	Step	MW	Key Question			
1	Find the reciprocal of a number	N	7	76	Ex 1.1 Q3, 4			
2	Work with reciprocals	N	8	76	Ex 1.1 Q5			
3	Use negative indices	N	7	154	Ex 1.2 2, 3			
4	Work out powers of fractions	N	8		Ex 1.2 Q5			
5	Write numbers using standard form	N	7	N45a, N45b	Ex 1.3 Q5			
6	Order numbers written in standard form	N	8		Ex 1.3 Q7			
7	Calculate with numbers written in standard form	N	8	83	Ex 1.4 Q3, 4, 5			
8	Calculate with fractional indices	N	9	188	Ex 1.5 Q3, 6, 7			
9	Use surds	N	9	207a, 207b	Ex 1.6 Q3, 4			
10	Understand the difference between rational and irrational numbers	N	10		Ex 1.6 Q10, 11			




Unit 2 – Quadratics

	Objective	Strand	Step	MW	Key Question			
1	Generate sequences using quadratic expressions	A	7	A23b	Ex 2.1 Q6			
2	Find an expression for the nth term of a quadratic sequence	A	9	A23a, 213	Ex 2.1 Q9, 11			
3	Multiply pairs of brackets	A	7	A18	Ex 2.2 Q3, 4, 10			
4	Square a linear expression	A	8	A18	Ex 2.2 Q6, 11			
5	Use quadratic identities	A	8		Ex 2.2 Q9			
6	Factorise quadratic expressions into two brackets	A	9	157	Ex 2.3 Q4, 5, 7, 8			
7	Solve quadratic equations by factorising	A	9	157	Ex 2.4 Q3, 4			

Unit 3 – Inequalities, Equations and Formulae




	Objective	Strand	Step	MW	Key Question			
1	Solve linear inequalities and represent the solution on a number line	A	7	A20a, A20b,	Ex 3.1 Q6, 8, 11			
2	Multiply both sides of an inequality by a negative number	A	7		Ex 3.1 Q13			
3	Use index laws and zero and negative powers	A	7	82, 154	Ex 3.2 Q5, 7			
4	Explain the difference between equations, formulae and functions	A	6	137	Ex 3.1 Q5			
5	Construct and solve complex equations	A	8	A19b	Ex 3.3 Q11			
6	Change the subject of a formula	A	7	A13a, A13b, 190	Ex 3.4 Q5, 11, 13			
7	Change algebraic fractions to equivalent fractions	A	8		Ex 3.5 Q6			
8	Solve problems with fractions in formulae	A	9		Ex 3.5 Q7, 8			

Unit 4 – Collecting and Analysing data




	Objective	Strand	Step	MW	Key Question			
1	Identify sources of primary and secondary data	S	6		Ex 4.1 Q6			
2	Choose a suitable sample size	S	6	152	Ex 4.1 Q7			
3	Understand how to reduce bias in sampling and questionnaires	S	7	152	Ex 4.1 Q8, 9, 10			
4	Identify a random sample	S	7		Ex 4.1 Q12			
5	Draw and interpret stem and leaf diagrams	S	6	128b	Ex 4.2 Q3			
6	Construct and interpret frequency polygons	S	6	65b	Ex 4.2 Q6			
7	Use frequency polygons to compare data	S	7	65b	Ex 4.2 Q7			
8	Estimate the mean and range from a grouped frequency table	S	8	S10b	Ex 4.3 Q4			
9	Draw conclusions from tables and charts	S	8		Ex 4.3 Q3			
10	Interpret statistics	S	7	S6, S7	Ex 4.4 Q5			

11	Draw and interpret box plots	S	8	187	Ex 4.4 Q6, 7			
12	Compare data using box plots	S	9	187	Ex 4.4 Q8			
13	Draw cumulative frequency graphs for grouped data	S	9	186	Ex 4.5 Q3			
14	Interpret cumulative frequency graphs	S	9	186	Ex 4.5 Q4			
15	Construct and interpret Histograms	S	11	205	Ex 4.6 Q4, 5			

Unit 5 – Multiplicative reasoning




	Objective	Strand	Step	MW	Key Question			
1	Recognise data sets that are in proportion	R	6	R8	Ex 5.1 Q1			
2	Set up equations that show direct proportion	R	7		Ex 5.1 Q4, 5			
3	Set up equations to show direct proportion	R	7	199	Ex 5.2 Q4			
4	Use algebra to solve problems involving proportion	R	7	199	Ex 5.2 Q10, 11			
5	Use algebra to solve problems involving different types of proportion	R	9	R13, 199	Ex 5.3 Q3, 7			
6	Work out the length of an arc	G&M	8	167	Ex 5.4 Q5			
7	Work out the area of a sector	G&M	8	167	Ex 5.4 Q5			
8	Solve problems involving arcs and sectors	G&M	9	167	Ex 5.4 Q6, 8			

Unit 6 – Non-linear Graphs




	Objective	Strand	Step	MW	Key Question			
1	Understand and draw graphs of quadratic functions	A	7	A15	Ex 6.1 Q7			
2	Identify quadratic graphs and their features	A	8		Ex 6.1 Q9			
3	Solve problems using quadratic graphs	A	8		Ex 6.1 Q10			
4	Use quadratic graphs to solve equations	A	9	98	Ex 6.2 Q6, 7			
5	Understand and draw graphs of cubic functions	A	8	161	Ex 6.3 Q1, 3			
6	Identify cubic graphs and their features	A	8	161	Ex 6.3 Q9			

7	Identify and draw graphs of reciprocal functions	A	9	A28	Ex 6.4 Q4			
8	Solve problems using reciprocal graphs	A	9	A28	Ex 6.4 Q5			




Unit 7 - Accuracy and Measures

	Objective	Strand	Step	MW	Key Question			
1	Solve problems involving rates of change	R	8	R11a	Ex 7.1 Q3			
2	Convert units with compound measures	R	8		Ex 7.1 Q10			
3	Calculate density and pressure	R	8	R11b	Ex 7.2 Q4, 10			
4	Solve problems involving compound measures	R	8		Ex 7.2 Q14			
5	Understand the effect of rounding	N	7	G29	Ex 7.3 Q2			
6	Find upper and lower bounds	N	7	G29, 132	Ex 7.3 Q3, 8			
7	Calculate the lower and upper bounds of areas and volumes	N	9	206	Ex 7.4 Q4			
8	Calculate the lower and upper bounds of compound measures	N	9	206	Ex 7.4 Q7, 8			
9	Use upper and lower bounds to solve complex problems	N	9	206	Ex 7.5 Q7, 9			




Unit 8 - Graphical solutions

	Objective	Strand	Step	MW	Key Question			
1	Solve a pair of simultaneous equations	A	7	A24b, A26b	Ex 8.1 Q3, 8, 11			
2	Rearrange the equations of graphs to find the gradient and y-intercept	A	6		Ex 8.2 Q4			
3	Find the equation of a line between two points	A	8	159b	Ex 8.2 Q9, 10			
4	Solve more complex simultaneous equations	A	8	A26b, A26c	Ex 8.3 Q8, 10			
5	Solve simultaneous equations by drawing graphs	A	9	A24a	Ex 8.4 Q4, 11			
6	Solve inequalities by drawing straight lines	A	8	A27a, A27b	Ex 8.5 Q5, 8			
7	Solve inequalities that involve quadratic graphs	A	8	212	Ex 8.5 Q10, 11			

Unit 9 – Trigonometry

	Objective	Strand	Step	MW	Key Question			
1	Use conventions for naming sides of a right angled triangle	G&M	7	G35a	Ex 9.1 Q4			
2	Work out the tangent of any angle	G&M	8		Ex 9.1 Q5			
3	Use the tangent to work out an unknown side of a right angled triangle	G&M	9	G35a	Ex 9.1 Q7, 8			
4	Work out the sine ratio of any angle	G&M	8		Ex 9.2 Q4			
5	Use sine to work out the opposite side in a right-angled triangle	G&M	9	G35a	Ex 9.2 Q5, 6			
6	Work out the cosine ratio of any angle	G&M	8		Ex 9.3 Q4			
7	Use the cosine ratio to work out the adjacent side in a right-angled triangle	G&M	9	G35a	Ex 9.3 Q5, 6			
8	Use the trigonometric ratios to work out an unknown angle in a right-angled triangle	G&M	6	G35b	Ex 9.4 Q6, 7			
9	Use trigonometry to solve problems involving missing lengths and angles	G&M	9	G35a, G35b	Ex 9.5 Q6, 7			
10	Plot and sketch graphs of trigonometric function	G&M	11	195a, 195b	Ex 9.6 Q3, 7, 9			
11	Use the trigonometric ratios with any angle from 0 to 360	G&M	11	195a, 195b				

Unit 10- Mathematical reasoning

	Objective	Strand	Step	MW	Key Question			
1	Explain, show and justify a mathematical solution	A	9	156	Ex 10.1 Q7			
2	Draw graphs to solve mathematical problems	A	9		Ex 10.2 Q5			
3	Identify the difference between giving an example and proving a theory	A	9	G23, 193	Ex 10.3 Q4			
4	Understand how to use mathematical proof	A	9	193	Ex 10.3 Q5, 10			
5	Present a logical argument using algebra	A	9	193	Ex 10.4 Q11			