

Year 9 Theta 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 – Indices and Standard Form




	Objective	Strand	Step	MW	Key Question			
1	Calculate combinations of indices, fractions & brackets	N	6	N20	Ex1.1 Q2,3			
2	Use index laws to simplify expressions	N	7	N25, 29, 82, 131	Ex1.1 Q12			
3	Calculate combinations of powers, roots, fractions and brackets	N	6	N20, N25	Ex1.2 Q1, 2			
4	Estimate answers to calculations	N	7	N43a, N43b	Ex1.2 Q3			
5	Understand negative and 0 indices	N	7	154	Ex1.3 Q12			
6	Use powers of 10 and their prefixes	N	6		Ex1.4 Q4			
7	Write large and small numbers using standard form	N	7	N45a, N45b	Ex1.4 Q8			
8	Enter and read standard form numbers on your calculator	N	7		Ex1.4 Q11			
9	Order numbers written in standard form	N	8	N45a, N45b	Ex1.4 Q13			

Unit 2 – Expressions and Formulae




	Objective	Strand	Step	MW	Key Question			
1	Use the priority of operations when substituting into algebraic expressions	A	6	A10	Ex2.1 Q2			
2	Substitute integers into expressions involving powers and roots	A	5	95	Ex2.1 Q6,9			
3	Write expressions and formulae	A	5		Ex2.2 Q3			
4	Solve equations by substituting into formulae	A	7	A3	Ex2.3 Q7			
5	Change the subject of a formula	A	6	136, 190	Ex2.3 Q12			
6	Simplify expressions involving brackets	A	6	93, 134a	Ex2.4 Q4			
7	Use the rules of indices for multiplying and dividing	A	6	29, 82	Ex2.4 Q10			
8	Factorise an expression by taking out an algebraic common factor	A	7	A9, 94	Ex2.4 Q15			

9	Multiply out double brackets and collect like terms	A	8	A19a, 134b	Ex2.5 Q6			
---	---	---	---	------------	----------	--	--	--

Unit 3 – Dealing with Data




	Objective	Strand	Step	MW	Key Question			
1	Identify sources of primary and secondary data	S	5		Ex3.1 Q2,4			
2	Choose a suitable sample size and what data to collect	S	5	152	Ex3.1 Q5			
3	Identify factors that might affect data collection and plan to reduce bias	S	7		Ex3.1 Q10			
4	Design a good questionnaire	S	6		Ex3.2 Q9			
5	Design and use data collection sheets and tables	S	5	S3,S4	Ex3.2 Q6			
6	Find the modal class of a set of grouped data	S	5	S10a	Ex3.3 Q7			
7	Estimate the mean from a large set of grouped data	S	7	S10b	Ex3.3 Q7			
8	Construct and use a line of best fit to estimate missing values	S	6	S8	Ex3.4 Q1, 2, 3			
9	Identify and explain outliers in data	S	6	129	Ex3.4 Q1, 2, 3			
10	Identify further lines of enquiry	S	7		Ex3.4 Q4			
11	Construct and use frequency polygons	S	7	65b	Ex3.4 Q6			
12	Write a report to show survey results	S	7		Ex3.5 Q6			

Unit 4 – Multiplicative Reasoning




	Objective	Strand	Step	MW	Key Question			
1	Enlarge 2D shapes using a positive whole number scale factor	G&M	6	G28	Ex 4.1 Q4			
2	Find the centre of enlargement by drawing lines on a grid	G&M	7	G28	Ex 4.1 Q10			
3	Enlarge 2D shapes using a negative whole number scale factor	G&M	7	G34	Ex 4.2 Q2			
4	Enlarge 2D shapes using a fractional scale factor	G&M	7	148	Ex 4.2 Q4			

5	Understand that the scale factor is the ratio of the lengths of corresponding sides	G&M	8		Ex 4.2 Q6			
6	Find an original value using inverse operations	R	7	110	Ex 4.3 Q5			
7	Calculate percentage change	R	8	109	Ex 4.3 Q9			
8	Solve problems using compound measures	R	8	R11a, R11b	Ex 4.4 Q6, 7			
9	Solve problems using constant rates and related formulae	R	8		Ex 4.4 Q9, 11			
10	Round numbers to a given number of significant figures	N	6	N38	Ex 4.5 Q5			
11	Solve problems using percentage change and rates of change	R	8		Ex 4.5 Q10			
12	Solve problems using ratio and scale factors	R	8		Ex 4.5 Q8			

Unit 5 – Constructions




	Objective	Strand	Step	MW	Key Question			
1	Use scales on maps and diagrams	R	5	R6	Ex 5.1 Q8			
2	Draw diagrams to scale	R	7	G15	Ex 5.1 Q6			
3	Make accurate constructions using drawing equipment	G&M	6	G26a, G25b, G26c	Ex 5.2 Q3, 5, 8			
4	Construct accurate triangles	G&M	6	47, 147	Ex 5.3 Q3, 6			
5	Construct accurate nets of solids involving triangles	G&M	7	G12c	Ex 5.3 Q11			
6	Draw loci for the paths of points	G&M	7	G27	Ex 5.4 Q8, 11			

Unit 6 – Equations, Inequalities and Proportionality

	Objective	Strand	Step	MW	Key Question			
1	Construct and solve equations with the unknown on both sides	A	6	A19b	Ex 6.1 Q3			




2	Construct and solve equations including brackets, powers and fractions	A	7	A19a, 135a	Ex 6.1 Q7, 8, 12, 13			
3	Convert a recurring decimal to a fraction	A	7	189	Ex 6.2 Q7, 8, 9			
4	Know the difference between equations and identities	A	5		Ex 6.2 Q2			
5	Use trial and improvement methods to find solutions to equations	A	7	A16, A25	Ex 6.3 Q8			
6	Solve linear inequalities	A	6	A20b	Ex 6.4 Q9, 12			
7	Represent solutions to inequalities on a number line	A	7	A20a	Ex 6.4 Q14			
8	Set up equations to show direct proportion	A	6	R8	Ex 6.5 Q4			
9	Recognise data sets that are proportional	A	6	R8	Ex 6.5 Q5			
10	Use algebra to solve problems involving proportion	A	6	199	Ex 6.5 Q10			
11	Solve a pair of simultaneous equations	A	7	A24b, A26b	Ex 6.1 Q2, 6, 9			

Unit 7 - Circle, Pythagoras and Prisms

	Objective	Strand	Step	MW	Key Question			
1	Calculate the circumference of a circle	G&M	6	G22a	Ex 7.1 Q7			
2	Estimate calculations involving pi	G&M	7		Ex 7.1 Q10			
3	Solve problems involving the circumference of a circle	G&M	7	G22a	Ex 7.1 Q14			
4	Calculate the area of a circle	G&M	6	G22b	Ex 7.2 Q3			
5	Solve problems involving the area of a circle	G&M	7	G22b	Ex 7.2 Q5			
6	Find the length of an unknown side of a right-angled triangle	G&M	6	G30	Ex 7.3 Q5, 6			




7	Solve problems involving right-angled triangles	G&M	7	G30	Ex 7.3 Q8			
8	Calculate the volume and surface area of a right prism	G&M	7	G25a, G25b	Ex 7.4 Q6			
9	Calculate the volume and surface area of a cylinder	G&M	9	G25a, G25b	Ex 7.4 Q9, 11			
10	Find the lower and upper bounds for a measurement	N	7	G29	Ex 7.5 Q4			
11	Calculate percentage error intervals	N	8	109	Ex 7.5 Q6			

Unit 8 – Sequences and Graphs




	Objective	Strand	Step	MW	Key Question			
1	Use the nth term to generate a sequence	A	5	A11b	Ex 8.1 Q5			
2	Find the nth term of a sequence	A	6	A11c	Ex 8.1 Q8			
3	Recognise and continue geometric sequences	A	5	A11a	Ex 8.2 Q4			
4	Recognise and continue quadratic sequences	A	6	A23b	Ex 8.2 Q13			
5	Use distance-time graphs to solve problems	A	7	A21a	Ex 8.3 Q1			
6	Recognise graphs showing constant rates of change	A	6	A21b	Ex 8.3 Q6			
7	Interpret graphs showing rates of change	A	7	216	Ex 8.3 Q8			
8	Draw a graph from its equation, without working out points	A	7	A14c	Ex 8.4 Q4			
9	Write the equation of a line parallel to another line	A	7	A14b, A14c	Ex 8.4 Q6			
10	Compare graph lines using their equations	A	7	A14c	Ex 8.4 Q10			
11	Plot graphs with equations like $ax + by = c$	A	7	96	Ex 8.5 Q5			
12	Rearrange equations of graphs to $y = mx + c$	A	8	96	Ex 8.5 Q7			
13	Find inverse functions and plot their graphs	A	8	214a				
14	Solve simultaneous equations by drawing graphs	A	7	A24a	Ex 8.6 Q5			
15	Find the equation of a line through two points	A	7		Ex 8.6 Q8, 9			

16	Draw graphs with quadratic equations like $y=x^2$	A	7	A15	Ex 8.7 Q5			
17	Interpret graphs of quadratic functions	A	7	A15	Ex 8.7 Q10			
18	Draw graphs of cubic equations like $y=x^3$	A	7	161	Ex 8.8 Q5			
19	Interpret non-linear graphs	A	7	A21b	Ex 8.8 Q9			

Unit 9 - Probability

	Objective	Strand	Step	MW	Key Question			
1	Calculate probabilities from tables	P	5	P5	Ex 9.1 Q4			
2	Compare probabilities	P	6	P2a	Ex 9.1 Q7			
3	Calculate estimates of probability from experiments or survey results	P	6	125	Ex 9.2 Q2			
4	Use experimental probabilities to predict outcomes	P	6	125	Ex 9.2 Q8			
5	List all the possible outcomes of one or two events in Venn diagrams, tables and sample space diagrams	P	6	P4, P6	Ex 9.3 Q3, 10			
6	Compare experimental and theoretical probabilities	P	6	125	Ex 9.3 Q6			
7	Decide if a game is fair	P	6		Ex 9.3 Q11			
8	Calculate the probability of two independent events	P	6	204	Ex 9.4 Q5			
9	Use tree diagrams	P	7	151	Ex 9.4 Q9			

Unit 10 - Comparing shapes

	Objective	Strand	Step	MW	Key Question			
1	Use congruent shapes to solve problems about triangles and quadrilaterals	G&M	7	G31	Ex 10.1 Q3			
2	Work out whether shapes are similar, congruent or neither	G&M	6	144	Ex 10.1 Q6			

3	Solve problems involving similar triangles	G&M	7	144	Ex 10.2 Q9			
4	Use conventions for naming sides of a right angled triangle	G&M	8	G35a	Ex 10.3 Q3			
5	Work out the tangent of any angle	G&M	9	G35a	Ex 10.3 Q5			
6	Use the tangent to work out an unknown side of a right angled triangle	G&M	9	G35a	Ex 10.3 Q7			
7	Work out the sine ratio of any angle	G&M	8	G35a	Ex 10.4 Q3			
8	Use sine to work out the opposite side in a right-angled triangle	G&M	9	G35a	Ex 10.4 Q4			
9	Work out the cosine ratio of any angle	G&M	8	G35a	Ex 10.5 Q4			
10	Use the cosine ratio to work out the adjacent side in a right-angled triangle	G&M	9	G35a	Ex 10.5 Q5			