

Mathematics GCSE

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Mrs Clay – Head of Mathematics



GCSE Exams

- 71% of our students gained 9-4 in their mathematics GCSE in 2019.
- 40% of our students gained 9-5 in their mathematics GCSE in 2019.
- 2 students gained a grade 9



GCSE Exams

- AQA board
- 2 tiers of entry
 - Higher 9 to 4
 - Foundation 5 to 1



I have heard that it
is easier to get a
grade 5 from the
higher paper

**Students
say**



This is not true. In fact more students than ever are entered for the foundation exam. The exam board advice is that unless you can gain a grade 6 the best option maybe the foundation tier.



The grade 5 from the
higher paper is
better than a grade 5
from foundation

**Students
say**



This is not true. A grade 5 is equivalent on both papers. Around 30% of the questions are on both papers.

For most courses it does not matter if the grade 5 is from higher or foundation



Be careful of STEM subjects especially engineering



Can I chose which
tier I want to take?

**Students
ask**



No. This will be decided by the school using all of the assessment data we have on you up to the mock in year 11. If needs be this will also be discussed with your parents/guardians.



- Pupils will be taught lessons to match the tier that best suits their attainment.
- Not much difference to years 7,8 or 9. GCSE mathematics is an 11 year course not a 2 year one.
- Lessons will contain work to help pupils gain a deeper understanding of each topic
- Lessons will contain exam style questions



- 10R2 and 10L2 are studying the foundation SOW in year 10.
- At the end of the year they will sit a foundation mock examination.
- They will need to gain a grade 4 or grade 5 to continue onto the higher course.



Skills tests – in class

Northgate
Name

Maths Basic Skills

Foundation plus

Section A: Numbers & calculating

1. To increase an amount by 7%, what single multiplier would you use?

2. Decrease £28 by 7%

3. Without a calculator work out:
 0.2×0.3

4. Estimate the answer to:
 17×193

5. Use a calculator to work out: (1dp)
 $6.38 + 4.52$
 $4.71 + 9.53$

6. Write 0.29 as a fraction

7. Work out the balance for £4500 invested for 2 years at 4% per annum

8. In a "20% off" sale, a coat was £220. Work out the original price.

9. Write 84000 in standard form:

10. Work out $(4 \times 10^4) \times (2 \times 10^2)$
Give your answer in standard form

Date

Section B: Algebra & Shape, space & measures

11. Expand & simplify:
 $(x+2)(x+3)$

12. Solve: $x+1 < 5$

13. Make n the subject of the formula:
 $M=3n$

14. Write down the next term in this sequence: 1 4 9 16 25

15. If $y = 3x^2 + 4$, find the value of y when $x = 2$

16. Factorise: $x^2 + 5x + 4$

17. Multiply & simplify: $(3x-2)^2$

18. Make r the subject of the formula:
 $A = \pi r^2$

19. $S = \frac{v^2 + v^2}{2a}$ Find S when, $v = -2$
 $a = 2$

20. If $\tan x = \frac{3}{8}$, find x (3sf)

Class

Section C: Using and a

21.

To find 'a' choose one
 $\sqrt{4^2 + 3^2}$ OR $\sqrt{4^2 - 3^2}$

22. Work out the vol



23. A plane flies 240mph. Ho

24. On a spin
 $P(3) = \frac{1}{6}$ and
What is the

25. What i

Total (A)

Total (B)

Test Total (A+B+C)

R (0-9)

Y (10-19)

Model Solutions - Test 1

11. $(x+2)(x+3) = x^2 + 3x + 2x + 6 = x^2 + 5x + 6$

12. $x+1 < 5 \Rightarrow x < 4$

13. $M=3n \Rightarrow n = \frac{M}{3}$

14. Sequence: 1, 4, 9, 16, 25, 36

15. $y = 3x^2 + 4$, $x=2 \Rightarrow y = 3(4) + 4 = 12 + 4 = 16$

16. $x^2 + 5x + 4 = (x+1)(x+4)$

17. $(3x-2)^2 = 9x^2 - 12x + 4$

18. $A = \pi r^2 \Rightarrow r = \sqrt{\frac{A}{\pi}}$

19. $S = \frac{v^2 + v^2}{2a} = \frac{2v^2}{2a} = \frac{v^2}{a}$
 $v = -2, a = 2 \Rightarrow S = \frac{4}{2} = 2$

20. $\tan x = \frac{3}{8} \Rightarrow x = \tan^{-1}(\frac{3}{8}) \approx 20.1^\circ$

21. $x^2 + 2x = 0 \Rightarrow x(x+2) = 0 \Rightarrow x = 0$ or $x = -2$

22. $12^2 + x^2 = 13^2 \Rightarrow x^2 = 169 - 144 = 25 \Rightarrow x = 5$

23. $240 \text{ mph} \times 2 \text{ hours} = 480 \text{ miles}$

24. $P(3) = \frac{1}{6} \Rightarrow \frac{1}{6} = \frac{1}{6} \Rightarrow \text{Probability} = \frac{1}{6}$

25. $y = 3x + 2$, gradient = 3

Area of circle: $\pi r^2 = \pi \times 5^2 = 25\pi$

Circumference: $2\pi r = 2\pi \times 5 = 10\pi$

Area of rectangle: $17 \times 6 = 102$

Area of triangle: $\frac{1}{2} \times 6 \times 8 = 24$

Area of cylinder: $2\pi r h = 2\pi \times 5 \times 5 = 50\pi$

Probability: $\frac{1}{6} + \frac{1}{6} = \frac{2}{6} = \frac{1}{3}$

Volume: $6 \times 5 \times 5 = 150$



Skills tests – in class

Higher			Test					4		Set							10R1					Total			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total
1	0	0	1	1	1	1	0	0	0	1	1	0	0	0	0	1	0	0	0	1	0	1	1	1	12
1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	0	0	0	0	0	1	1	0	0	0	13
1	1	0	1	1	1	1	1	1	0	1	1	1	0	0	0	1	0	0	1	0	1	1	1	1	17
1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	0	0	0	1	0	1	1	1	19
1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	0	0	0	0	0	1	1	1	1	1	16
1	1	1	1	1	0	1	0	1	0	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	18
1	1	0	0	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	10
1	1	1	1	1	0	1	1	1	0	1	0	0	1	0	1	1	0	0	1	1	1	1	1	1	18
1	1	1	1	1	1	1	1	1	0	1	1	0	1	0	1	1	1	0	1	0	1	0	1	0	17
1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	0	1	1	0	0	1	19
1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	0	0	0	1	0	1	0	0	1	15
1	1	1	1	1	0	0	1	0	0	1	1	1	1	0	1	1	0	0	0	1	1	0	1	1	16
1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	0	1	0	0	1	1	1	0	0	1	17
1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	0	0	1	1	1	0	0	0	1	22
1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	1	1	1	1	1	18
1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	1	1	0	1	1	17
1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	0	0	0	0	0	1	1	0	1	1	16
1	1	1	1	1	0	0	1	1	0	1	1	0	1	0	0	1	1	0	1	1	0	0	0	1	15
1	1	1	1	1	1	1	0	1	0	1	1	0	1	0	1	1	0	0	0	1	1	0	0	1	16
1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	0	1	0	0	0	0	1	1	1	1	16
1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	1	0	0	0	0	1	1	1	1	18
1	1	1	1	1	1	1	1	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	11

- Skills tests are analysed by the class teacher so that pupils get targeted lessons/revision.
- The pupils have a grid too so they can see what they need to revise.



Core Skills Homework

Homework Name: _____
Due date: _____

1) What single multiplier would you use to increase an amount by 36%?	2) Write the following
What single multiplier would you use to decrease an amount by 14%?	a) 4.28×10^{-4} b) 1.23×10^2 c) 6.8×10^4
3) Increase £360 by 28%	4) Make t the subject
5) An amount was decreased by 20%. If the new amount is £44.80, what was the amount before it was decreased?	6) Find n in the sequence
7) Solve: $7x - 3 = 5x + 7$	8) Find n
9) Find the circumference of a circle with a diameter of 11cm.	
Teacher Comment: _____	

Stage E Autumn 2 HW 1

NAME: _____

1) Calculate

a) $-4 + -8 = -12$
b) $-5 \div 36 = 1$
c) $-4 \times 5 = -20$
d) $20 + -10 = -2$

2) Simplify

a) $76 \times 70 = 7^7$
b) $9^{10} \div 9^4 = 9^6$

3) Convert 0.48 to a fraction in simplest form.
 $0.48 = 48\% = \frac{48}{100} = \frac{24}{50} = \frac{12}{25}$

4) Convert $\frac{9}{20}$ to a percentage.
 $\frac{9}{20} = \frac{9 \times 5}{20 \times 5} = \frac{45}{100} = 45\%$

5) What is the percentage multiplier when a value is increased by 16%?
Start
 $100\% + 16\% = 116\% = 1.16$
↑
increase

6) Find 30% of £28
 $10\% = 28 \div 10 = \underline{\underline{£2.80}}$
 $30\% = 2 \times 2.80 \times 3 = \underline{\underline{£8.40}}$

7) What is the n th term of the sequence
24, 28, 30, 32, 34,
 $2n + 24$

8) Use $\pi = 3$. Calculate the circumference of a circle with a diameter of 4cm.
 $C = \pi \times \text{diameter}$
 $3 \times 4 = \underline{\underline{12cm}}$

9) Use $\pi = 3$. Calculate the area of a circle with a radius of 5cm.
 $\text{Area} = \pi \times r^2$
 $= 3 \times 5^2$
 $= 3 \times 25 = \underline{\underline{75cm^2}}$

10) What is the volume of a cuboid with length 3cm, width 7cm and height 10cm?
 $\text{Volume} = \text{length} \times \text{width} \times \text{height}$
 $= 3 \times 7 \times 10$
 $= 21 \times 10 = \underline{\underline{210cm^3}}$

Helps revise the core skills needed for GCSE.

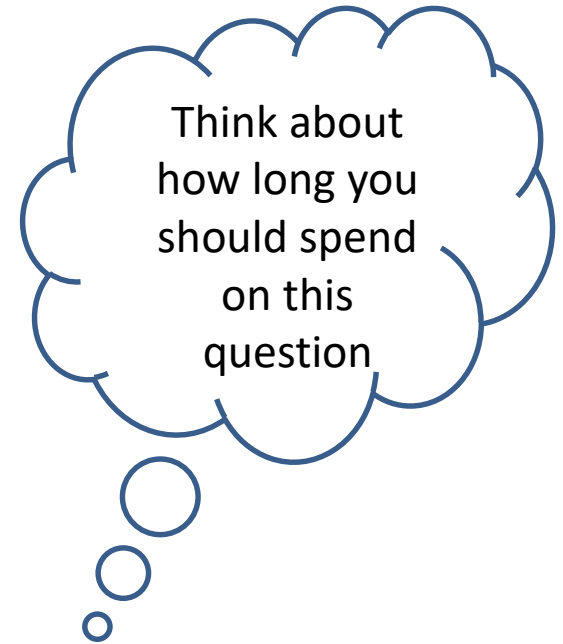
A set of model solutions will be provided to give guidance for future questions



Exam Technique - Calculations

Nadia has £5 to buy pencils and rulers.

Prices	
Pencils	8p each
Rulers	30p each



She says,

“I will buy 15 pencils.

Then I will buy as many rulers as possible.

With my change I will buy more pencils.”

How many pencils and how many rulers does she buy?

(Total 6 marks)



What is the point
of doing maths?

**Students
ask**



Learning skills is important but the main aim is.....

To be able to solve problems



Questions?

What
method do I
have to
use?



Any correct
method can be
used



Questions?

What mark
do I have to
get a grade
4?

There is no set grade it
depends on the students
across year 11 in all schools

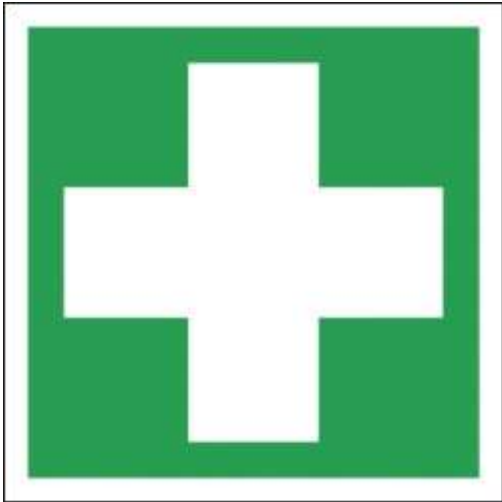


Make sure you have a working calculator

It is essential that students bring a calculator to EVERY lesson.



If you are absent



- Find out from your teacher what you have missed
- Copy up notes from a friend's book
- Watch the relevant clip on Mathswatch
- Complete the work covered in the lesson
- Seek extra help from **any** maths teacher
- Check SMHW to see if any homework has been set



Homework

Make sure you are checking SMHW every week

- Core skills – repetition of topics (over 300 to remember)
- Current topic
- Mathswatch tasks (logins and passwords available from class teacher)
- Research
- Revision



Revision

- Start NOW.
- Make time to go through revision notes and make revision cards every day/week



Other revision aids

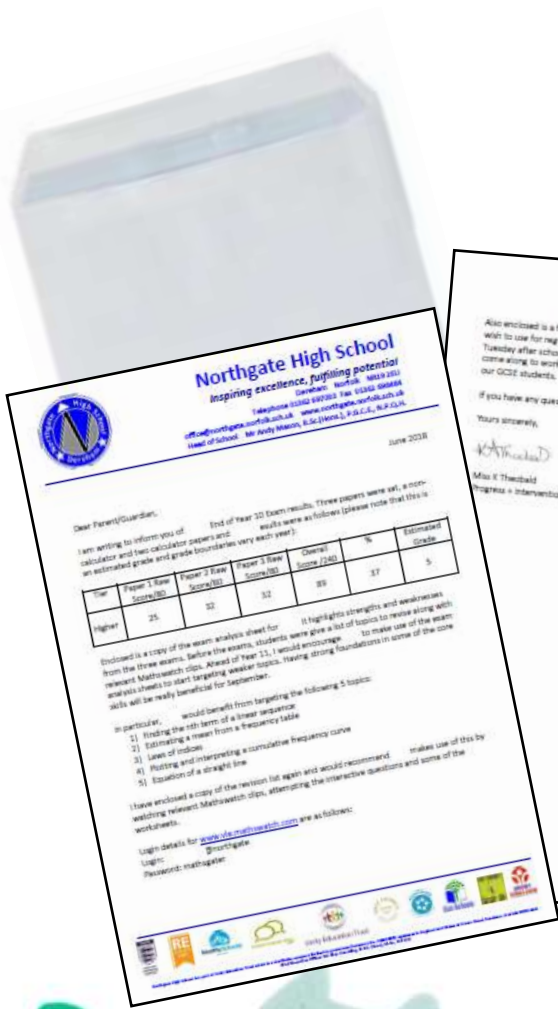
- Mathswatch has around 300 videos and worksheets that students can go through.
- SAM Learning



SAM
Learning



Pack of materials from last year



Also enclosed is a flyer which recommends some useful Maths revision websites that you may wish to use for regular revision. Finally, the Maths Department runs a Maths workshop every Tuesday after school from 3.30pm - 4.30pm in MAG. Students from any year group are invited to come along to work on their Maths and gain extra support. It has proven particularly useful for our GCSE students.

If you have any questions, please feel free to contact me on kt@northgate.hants.sch.uk

Yours sincerely,
Miss K Theobald
Progress & Intervention Coordinator for Maths

PAPER 2				
#	Task	Marks	Attempt	%
1	Calculate with indices	1	1	100%
2	Vectors	1	1	100%
3	Linear sequence	1	1	100%
4	Functions	1	1	100%
5	Quadratic sequence	3	3	100%
5a	Compound interest	2	2	100%
6b	Interest problem	4	4	100%
7	Trigonometry	2	2	100%
8	Product of prime factors/index form	3	3	100%
9	Identify and equivalent expressions	5	0	0%
10	Area	4	4	100%
11a	Estimate of mean	4	4	100%
11b	Evaluate solutions	2	2	100%
12	Venn Diagram Probability	6	1	20%
13a	Inverse proportion	3	3	100%
13b	Inverse proportion	1	1	100%
14a	Standard form	3	1	33%
14b	Standard form	2	1	50%
15	Quadratic expression and equations	4	1	25%
16	Reverse percentage problem	4	4	100%
17a	Equation of a circle	1	1	100%
17b	Equation of a circle	1	0	0%
17c	Equation of a circle	2	0	0%
18	Similar shapes	4	4	100%
19	Surface area of a cone problem	6	0	0%
20	Algebraic proof	6	4	66%
21	Product rule for counting	3	1	33%
22	Volume of solids	4	0	0%
		80	52	

After last year's end of year examination you should have received a pack explaining what topics to target for revision over the summer.



Workshop

- Every Tuesday 3:30pm to 4:30pm in Ma6

The workshop is manned by members of the mathematics team.

- Bring along your OWN work

These are not teacher lead sessions. Pupils work on questions they have tried at home and bring along to get support and guidance on how to solve these problems.



Revision materials will be offered to year 10 students.



Northgate High School
Inspiring excellence, fulfilling potential

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Head of School Mr Andy Mason, B.Sc.(Hons.), P.D.C.E., N.P.Q.R.

Dear Parent/Guardian

September 2017

I am writing to inform you of an opportunity for your son/daughter to purchase some Maths resources to use as part of his/her revision in Maths.

After completing mock exams at the end of Year 10 and completing skills tests once a fortnight, all Year 11 pupils should now know where their gaps are in particular topics and should be working hard to close these. A number are already attending our after school Maths workshop on a Tuesday in MA1 from 3.30pm - 4.30pm and we would encourage even more to come along.

On top of this we are able to offer for reduced prices, a Maths Revision Guide (£2.50), Maths Workbook with solutions (£3.50) and Mathsbuster DVD-Rom or online edition (£5.00). In the run up to the GCSE exams, it is important that any weaknesses are addressed and these resources can be used as part of the process along with other online resources available. Starting the revision process early is really beneficial.

If you are interested in purchasing any of these resources, please return the slip below with payment (cash or cheque) to Student Services, indicating which you are ordering. Alternatively, you can pay using the online cashless system; however the slip should still be handed in to Student Services or the Finance Office. We will ensure the appropriate items/resources (Foundation/higher) are then ordered. We have a strict deadline for ordering and are asking that all orders are placed by Friday 8th October.

Please also be aware of other websites that can be used for Maths revision including www.vle.mathswatch.com, www.corbettmaths.com, our own Mathsgater website (and Facebook page) and the new GCSEPod (www.gcsepod.com).

If you have any questions, please do not hesitate to contact me.
Yours sincerely

Miss Theobald
Maths Progress & Intervention Coordinator (ktheobald@ngs.net)

MAC Miss Theobald - Maths
Name of pupil: _____ Maths Teaching Group: _____

I would like to purchase (please tick as appropriate):

- Maths workbook + Answer book - £3.50
- Maths Revision Guide - £2.50
- Mathsbuster DVD-Rom - £5.00
- Mathsbuster Online edition - £5.00

Signed (parent/carer): _____



Year 11 Maths Revision Resources

Mathswatch: (www.vle.mathswatch.com) – videos, one minute clips, interactive questions, worksheets, 6 week revision schedule + more.
username (example) – JBloggs@northgate,
password – mathsgater (case sensitive)

Mathsgater:
(<https://sites.google.com/site/mathsgater/home>) – past papers, resources, links + videos.

Like

‘Like’ the page + get links, top revision tips + a Question a Day!

Facebook (search Mathsgater):
Sticky Studying App: you will be given a unique app code (available on iTunes + android) – quirky Maths videos using memory techniques.

Corbett Maths: (www.corbettmaths.com) – videos, 5-a-day questions, worksheets, exam questions + revision cards (we have purchased 2 sets for use in the workshop).

Mathsgenie:
(www.mathsgenie.com) – GCSE Revision section 9-1 grading, videos, worksheets + solutions.

GCSEpod:
(www.gcsepod.com) – sign up and get access to podcasts for all topics + subjects.

