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EDEXCEL GCSE (9-1) MATHS: QUESTIONS BY TOPIC

Powers, Roots, Standard Form & Surds (N3)

GCSE (9-1) Mathematics (1MA1) · Foundation tier

44 questions · 95 marks · Mark schemes included

Past papers June 2017 - June 2025 · 3 sub-topics

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HOW TO USE THIS BOOKLET

Questions are grouped by sub-topic and run from the lowest to the highest mark tariff, then oldest paper first.

Click any row below to jump straight to that sub-topic or question.

On every question page, click ANSWER in the top-right corner to jump to its mark scheme; < QUESTION brings you back.

A gold bar in the left margin marks exactly where the question sits on the original page.

Diagrams, graphs, grids and tables are printed exactly as they appear in the original papers.

Each question is filed under its main topic; longer questions may also test skills from other topics.

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N3c SURDS

No questions on this sub-topic in the available past papers.



QUESTIONS

44 questions · 95 marks · 2 sub-topics

SUB-TOPIC N3a

POWERS, ROOTS & INDEX LAWS

Sub-topic N3a · 26 questions · 44 marks · lowest tariff first



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Work out the value of 2^4

(Total for Question 1 is 1 mark)

- 2 Write 7.26451 correct to 3 decimal places.

(Total for Question 2 is 1 mark)

- 3 (a) Simplify $7 \times e \times f \times 8$

(1)

- (b) Solve $\frac{x}{5} = 2\frac{1}{2}$

$x =$
(1)

(Total for Question 3 is 2 marks)

- 4 Write $\frac{4}{5}$ as a percentage.

.....%

(Total for Question 4 is 1 mark)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** Write $\frac{4}{50}$ as a percentage.

.....%

(Total for Question 1 is 1 mark)

- 2** Write 1.59 correct to 1 decimal place.

.....

(Total for Question 2 is 1 mark)

- 3** Work out the value of 3^5

.....

(Total for Question 3 is 1 mark)

- 4** Write down a 6 digit number that has 4 as its thousands digit.
You can only use the digit 4 once.

.....

(Total for Question 4 is 1 mark)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** Write down the value of the 4 in the number 542.3

.....

(Total for Question 1 is 1 mark)

- 2** Write down a square number that is also an odd number.

.....

(Total for Question 2 is 1 mark)

- 3** (a) Change 4560 g into kg.

.....kg
(1)

- (b) Change 7.3 m into mm.

.....mm
(1)

(Total for Question 3 is 2 marks)

- 4** Work out the cube root of 64

.....

(Total for Question 4 is 1 mark)

- 5** Write 0.31 as a fraction.

.....

(Total for Question 5 is 1 mark)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write a number in each box to make the calculation correct.

(i) $56.3 + \boxed{} = 100$ (1)

(ii) $\frac{2}{7} + \boxed{} = 1$ (1)

(Total for Question 1 is 2 marks)

2 Write 3% as a fraction.

(Total for Question 2 is 1 mark)

3 Find $\sqrt{1.44}$

(Total for Question 3 is 1 mark)

4 Work out $\frac{1}{8}$ of 720

(Total for Question 4 is 1 mark)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** Write 478 to the nearest hundred.

.....
(Total for Question 1 is 1 mark)

- 2** Write down a multiple of 8 that is between 41 and 60

.....
(Total for Question 2 is 1 mark)

- 3** Change 1.5 kilometres to metres.

..... metres
(Total for Question 3 is 1 mark)

- 4** Here is a list of numbers.

4 6 9 10 15 27 30 40

From the list, write down all the numbers that are powers of 3

.....
(Total for Question 4 is 1 mark)

- 5** Write 19% as a fraction.

.....
(Total for Question 5 is 1 mark)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** Write these numbers in order of size.
Start with the smallest number.

8 -4 1 -7 -2

.....
(Total for Question 1 is 1 mark)

- 2** Write the number 8375 correct to the nearest thousand.

.....
(Total for Question 2 is 1 mark)

- 3** Write 0.23 as a percentage.

..... %
(Total for Question 3 is 1 mark)

- 4** Find the value of $\sqrt{17.64}$

.....
(Total for Question 4 is 1 mark)



- 5 Find the value of 6^5

.....

(Total for Question 5 is 1 mark)

- 6 There are 14 rows of seats in a cinema.
There are 15 seats in each row.

A film was shown in the cinema on Saturday.
Each ticket for the film cost £6.50

The tickets that were sold cost a total of £1274

How many tickets were **not** sold?

.....

(Total for Question 6 is 3 marks)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Change 300 centimetres into metres.

..... metres

(Total for Question 1 is 1 mark)

- 2 Work out $\frac{1}{3}$ of 24

.....

(Total for Question 2 is 1 mark)

- 3 Write 40% as a fraction.

.....

(Total for Question 3 is 1 mark)

- 4 Work out 2.5^2

.....

(Total for Question 4 is 1 mark)

- 5 Write the following numbers in order of size.
Start with the smallest number.

1 -4 0 7 -6 -3 2

.....

(Total for Question 5 is 1 mark)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write $\frac{3}{10}$ as a percentage.

.....%

(Total for Question 1 is 1 mark)

- 2 Write the following numbers in order of size.
Start with the smallest number.

8 -7 -10 1 0 -2

.....

(Total for Question 2 is 1 mark)

- 3 Write $\frac{9}{100}$ as a decimal.

.....

(Total for Question 3 is 1 mark)

- 4 Write 327 correct to the nearest ten.

.....

(Total for Question 4 is 1 mark)

- 5 Write down the value of 7^2

.....

(Total for Question 5 is 1 mark)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** Write 35% as a fraction.

.....

(Total for Question 1 is 1 mark)

- 2** Work out $\frac{1}{4}$ of 28

.....

(Total for Question 2 is 1 mark)

- 3** Write down two factors of 12

.....

(Total for Question 3 is 1 mark)

- 4** Simplify $2m \times 3$

.....

(Total for Question 4 is 1 mark)

- 5** Find $\sqrt{1.69}$

.....

(Total for Question 5 is 1 mark)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** Write 0.3 as a fraction.

.....
(Total for Question 1 is 1 mark)

- 2** Work out 3^2

.....
(Total for Question 2 is 1 mark)

- 3** Work out $20 \div (3 + 2)$

.....
(Total for Question 3 is 1 mark)

- 4** Write down a factor of 60 that is between 8 and 14

.....
(Total for Question 4 is 1 mark)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

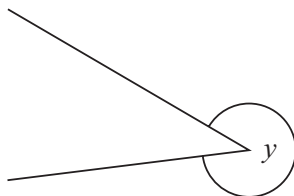
- 1 Write the number 18475 correct to the nearest thousand.

.....
(Total for Question 1 is 1 mark)

- 2 Write 0.3 as a percentage.

..... %
(Total for Question 2 is 1 mark)

- 3 Write down the mathematical name for the type of angle marked y .



.....
(Total for Question 3 is 1 mark)

- 4 Write these numbers in order of size.
Start with the smallest number.

0.21 0.2 0.03 0.1 0.16

.....
(Total for Question 4 is 1 mark)

- 5 Find the square root of 64

.....
(Total for Question 5 is 1 mark)



17 Solve $2(4x - 5) = 18$

$x =$

(Total for Question 17 is 3 marks)

18 Write down the value of 10^0

.....

(Total for Question 18 is 1 mark)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write down the value of the 7 in the number 3721

(Total for Question 1 is 1 mark)

- 2 Work out $\frac{1}{6}$ of 96

(Total for Question 2 is 1 mark)

- 3 Write down **two** factors of 16

(Total for Question 3 is 1 mark)

- 4 Write the following numbers in order.
Start with the lowest number.

−3 4 −7 6 0

(Total for Question 4 is 1 mark)

- 5 Find the value of $\sqrt{2.25}$

(Total for Question 5 is 1 mark)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write down the value of the 7 in the number 49.715

(Total for Question 1 is 1 mark)

- 2 Find $\sqrt{5.76}$

(Total for Question 2 is 1 mark)

- 3 Write 19% as a fraction.

(Total for Question 3 is 1 mark)

- 4 Here are some fractions.

$$\frac{3}{9} \quad \frac{6}{18} \quad \frac{2}{6} \quad \frac{4}{10} \quad \frac{5}{15}$$

Which one of these fractions is **not** equivalent to $\frac{1}{3}$?

(Total for Question 4 is 1 mark)



10 Jason says,

“The cube root of 27 is 9 because 27 divided by 3 is 9”

Is Jason correct?

You must give a reason for your answer.

.....

.....

.....

(Total for Question 10 is 1 mark)

11 Elena’s height is 136 centimetres.

George’s height is 1.2 metres.

Elena’s height is greater than George’s height.

How many centimetres greater?

..... centimetres

(Total for Question 11 is 2 marks)



20 Work out the value of $\frac{3^7 \times 3^{-2}}{3^3}$

(Total for Question 20 is 2 marks)

21 $v^2 = u^2 + 2as$

$$u = 12 \quad a = -3 \quad s = 18$$

(a) Work out a value of v .

(2)

(b) Make s the subject of $v^2 = u^2 + 2as$

(2)

(Total for Question 21 is 4 marks)



15 (a) Write down the value of $\sqrt{64}$

.....
(1)

(b) Work out the value of 5^3

.....
(1)

(Total for Question 15 is 2 marks)

16 (a) Expand $5(2m - 3)$

.....
(1)

(b) Factorise $3n + 12$

.....
(1)

(Total for Question 16 is 2 marks)



13 (a) Simplify $2a \times 5b$

.....
(1)

(b) Simplify $3x + 2y + 5x - y$

.....
(2)

.....
(Total for Question 13 is 3 marks)

14 Work out 23×15

.....
(Total for Question 14 is 2 marks)



20 (a) Simplify $c^5 \div c^2$

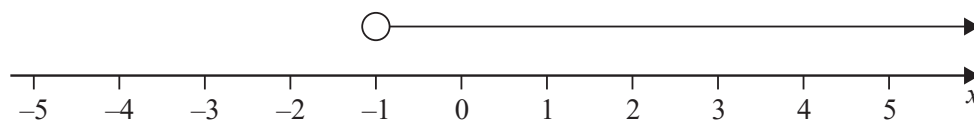
.....
(1)

(b) Simplify $(d^4)^3$

.....
(1)

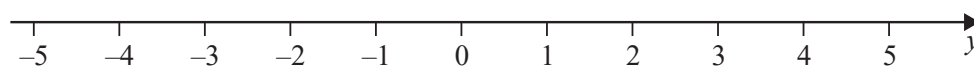
(Total for Question 20 is 2 marks)

21 (a) Write down the inequality shown on this number line.



.....
(1)

(b) On the number line below, show the inequality $-3 \leq y < 4$



(2)

(Total for Question 21 is 3 marks)

21 Simplify $(2^{-5} \times 2^8)^2$

Give your answer as a power of 2

(Total for Question 21 is 2 marks)

22 Work out 0.004×0.32

(Total for Question 22 is 2 marks)



29 Work out the value of $\frac{4^{-6} \times 4^9}{4}$

(Total for Question 29 is 2 marks)

30 Write down the exact value of $\cos 60^\circ$

(Total for Question 30 is 1 mark)



26 (a) Simplify $(p^2)^5$

.....
(1)

(b) Simplify $12x^7y^3 \div 6x^3y$

.....
(2)

(Total for Question 26 is 3 marks)



21 $p^3 \times p^x = p^9$

(a) Find the value of x .

$$x = \dots\dots\dots (1)$$

$$(7^2)^y = 7^{10}$$

(b) Find the value of y .

$$y = \dots\dots\dots (1)$$

$100^a \times 1000^b$ can be written in the form 10^w

(c) Show that $w = 2a + 3b$

(2)

(Total for Question 21 is 4 marks)



19 (a) (i) Write down the value of 5^0

.....
(1)

(ii) Write down the value of 5^{-2}

.....
(1)

(b) Write $\frac{2^5 \times 2^4}{2^3}$ in the form 2^n where n is an integer.

.....
(2)

(Total for Question 19 is 4 marks)



20 (a) Simplify $m^3 \times m^4$

.....
(1)

(b) Simplify $(5np^3)^3$

.....
(2)

(c) Simplify $\frac{32q^9r^4}{4q^3r}$

.....
(2)

(Total for Question 20 is 5 marks)



SUB-TOPIC N3b

STANDARD FORM

Sub-topic N3b · 18 questions · 51 marks · lowest tariff first

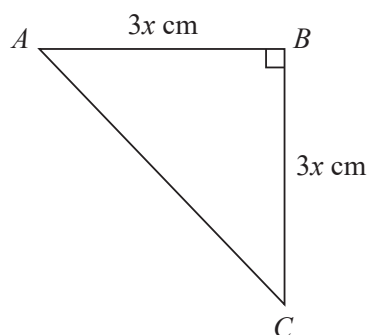


- 25 Work out $(13.8 \times 10^7) \times (5.4 \times 10^{-12})$
Give your answer as an ordinary number.

(Total for Question 25 is 2 marks)



17 ABC is an isosceles right-angled triangle.



The area of the triangle is 162 cm^2

Work out the value of x .

$x = \dots\dots\dots$

(Total for Question 17 is 3 marks)

18 Work out the value of $\frac{2.645 \times 10^9}{1.15 \times 10^3}$

Give your answer in standard form.

$\dots\dots\dots$

(Total for Question 18 is 2 marks)



26 £360 is shared between Abby, Ben, Chloe and Denesh.

The ratio of the amount Abby gets to the amount Ben gets is 2 : 7

Chloe and Denesh each get 1.5 times the amount Abby gets.

Work out the amount of money that Ben gets.

£.....

(Total for Question 26 is 4 marks)

27 (a) Write 0.00562 in standard form.

.....
(1)

(b) Write 1.452×10^3 as an ordinary number.

.....
(1)

(Total for Question 27 is 2 marks)



26 The n th term of a sequence is $2n^2 - 1$

The n th term of a different sequence is $40 - n^2$

Show that there is only one number that is in both of these sequences.

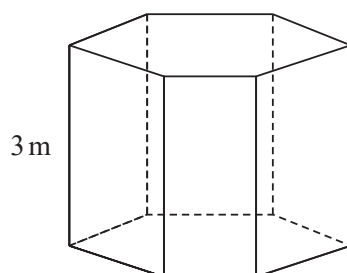
(Total for Question 26 is 3 marks)

27 Work out $(3.42 \times 10^{-7}) \div (7.5 \times 10^{-6})$
Give your answer in standard form.

(Total for Question 27 is 2 marks)



27 The diagram shows a prism placed on a horizontal floor.



$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The prism has height 3 m

The volume of the prism is 18 m^3

The pressure on the floor due to the prism is 75 newtons/m^2

Work out the force exerted by the prism on the floor.

..... newtons

(Total for Question 27 is 3 marks)

28 Write these numbers in order of size.
Start with the smallest number.

6.72×10^5

67.2×10^{-4}

672×10^4

$0.000\,672$

.....

(Total for Question 28 is 2 marks)



20 (a) Write 468 000 in standard form.

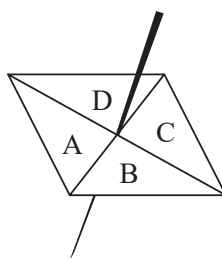
.....
(1)

(b) Write 5.037×10^{-4} as an ordinary number.

.....
(1)

(Total for Question 20 is 2 marks)

21 Here is a biased spinner.



The table shows the probabilities that when the spinner is spun it will land on A, on B, on C and on D.

Letter	A	B	C	D
Probability	0.4	0.21	0.32	0.07

Luka will spin the spinner 200 times.

Work out an estimate for the number of times the spinner will land on A.

.....
(Total for Question 21 is 2 marks)



27 $1.25 \times 10^{-12} = k \times (4 \times 10^{-20})$

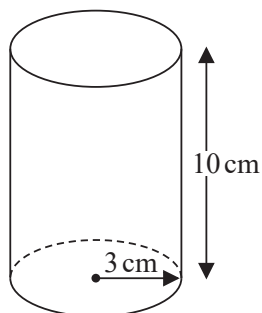
Work out the value of k .

Give your answer in standard form.

$k = \dots\dots\dots$

(Total for Question 27 is 2 marks)

28 The diagram shows a solid cylinder with base radius 3 cm and height 10 cm.



The cylinder is made from steel.

It has a mass of 2250 g.

Work out the density of the steel.

Give your answer correct to 3 significant figures.

$\dots\dots\dots \text{g/cm}^3$

(Total for Question 28 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS



18 (a) Write 3.402×10^5 as an ordinary number.

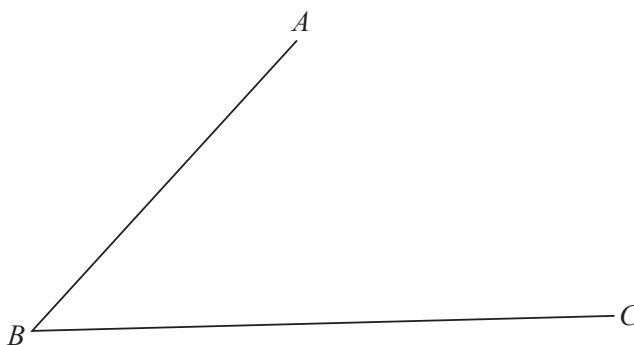
.....
(1)

(b) Write 0.8026 in standard form.

.....
(1)

(Total for Question 18 is 2 marks)

19 Use ruler and compasses to construct the bisector of angle ABC .
You must show your construction lines.



(Total for Question 19 is 2 marks)

14 (a) Factorise $5 - 10m$

.....
(1)

(b) Factorise fully $2a^2b + 6ab^2$

.....
(2)

(Total for Question 14 is 3 marks)

15 (a) Write 4.7×10^{-1} as an ordinary number.

.....
(1)

(b) Work out the value of $(2.4 \times 10^3) \times (9.5 \times 10^5)$
Give your answer in standard form.

.....
(2)

(Total for Question 15 is 3 marks)



20 Ami and Josh use a calculator to work out $\frac{595}{4.08^2 + 5.3}$

Ami's answer is 27.1115

Josh's answer is 271.115

One of these answers is correct.

Use approximations to find out which answer is correct.

(Total for Question 20 is 3 marks)

21 Work out $\frac{0.06 \times 0.0003}{0.01}$

Give your answer in standard form.

(Total for Question 21 is 3 marks)



28 (a) Write 32 460 000 in standard form.

.....
(1)

(b) Write 4.96×10^{-3} as an ordinary number.

.....
(1)

Asma was asked to compare the following two numbers.

$$A = 6.212 \times 10^8 \quad \text{and} \quad B = 4.73 \times 10^9$$

She says,

“6.212 is bigger than 4.73 so A is bigger than B .”

(c) Is Asma correct?

You must give a reason for your answer.

.....
.....
.....
(1)

(Total for Question 28 is 3 marks)



29 (a) Write 6.75×10^{-4} as an ordinary number.

.....
(1)

(b) Work out $\frac{2.56 \times 10^6 \times 4.12 \times 10^{-3}}{1.6 \times 10^{-2}}$

Give your answer in standard form.

.....
(2)

(Total for Question 29 is 3 marks)



- 23 Work out $5.7 \times 10^2 + 9.8 \times 10^3$
Give your answer in standard form.

(Total for Question 23 is 3 marks)



26 (a) Expand and simplify $(5x + 2)(2x - 3)$

.....
(2)

(b) Factorise $x^2 + 4x + 3$

.....
(2)

(Total for Question 26 is 4 marks)

27 (a) Write the number 0.000 075 47 in standard form.

.....
(1)

(b) Write 3.42×10^4 as an ordinary number.

.....
(1)

(c) Work out $\frac{2.3 \times 10^4 \times 6.7 \times 10^3}{5 \times 10^{-8}}$

.....
(2)

(Total for Question 27 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS



23 (a) Write 4.5×10^5 as an ordinary number.

.....
(1)

(b) Write 0.007 in standard form.

.....
(1)

(c) Work out $4.2 \times 10^3 + 5.3 \times 10^2$
Give your answer in standard form.

.....
(2)

(Total for Question 23 is 4 marks)



26 (a) Write 1.63×10^{-3} as an ordinary number.

.....
(1)

(b) Write 438 000 in standard form.

.....
(1)

(c) Work out $(4 \times 10^3) \times (6 \times 10^{-5})$
Give your answer in standard form.

.....
(2)

(Total for Question 26 is 4 marks)

27 A solid cuboid is made of metal.

The metal has a density of 9 g/cm^3

The volume of the cuboid is 72 cm^3

Work out the mass of the cuboid.

..... g

(Total for Question 27 is 2 marks)

28 (a) Write $(9 \times 10^4):(4.5 \times 10^6)$ in the form $1:n$ where n is an integer.

.....
(2)

(b) Write the following numbers in order of size.
Start with the smallest number.

$$5.625 \times 10^4$$

$$5625$$

$$56250 \times 10^{-3}$$

$$0.005625 \times 10^5$$

.....
(2)

(Total for Question 28 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS



23 (a) (i) Write 5.3×10^4 as an ordinary number.

.....
(1)

(ii) Write 7.4×10^{-5} as an ordinary number.

.....
(1)

(b) Calculate the value of $9.7 \times 10^6 + 2.45 \times 10^7$
Give your answer in standard form.

.....
(2)

(Total for Question 23 is 4 marks)



MARK SCHEMES

official mark schemes, in the same order as the questions



Paper: 1MA1/1F				
Question	Working	Answer	Mark	Notes
1		16	B1	cao
2		7.265	B1	cao
3 (a)		56ef	B1	cao
(b)		12.5	B1	oe
4		80	B1	cao
5		42	M1 A1	for showing method to work out 60% of 70, eg 0.6×70 or $(70 \div 10) \times 6 (= 42)$ cao
6 (i)		$\times$ at $\frac{1}{2}$	B1	
(ii)		$\times$ at 0	B1	
7		No (supported)	P1 P1 C1	process to work with either cost of 3 sausages e.g. $3 \times 2.30 (=6.9(0))$ or division of a cost by 3 process to work with costs of at least 3 of bread rolls, bread rolls, ketchup, change, sausages e.g. $2 \times 1.50 + 1.60$ or $1.50 + 1.60 + 0.30$, or $10 - 1.50 - 1.60 - 0.30$ or $10 - 1.50 - 1.50 - 1.60$ E.g. No and (£)5.10 and (£)6.90 No and (£)5.40 and (£)6.90 No and (£)1.70 No and (£)11.50 or (£)11.80 or shows cost of sausages at £2.30 and cost of any 2 other items is greater than (or equal to) £10 NB can work in £ or p throughout. Condone 5.1 etc



Paper: 1MA1/2F					
Question		Answer	Mark	Mark scheme	Additional guidance
1		8	B1	cao	
2		1.6	B1	cao	
3		243	B1	cao	
4		Suitable number eg. 564 000	B1	for a suitable 6 digit number with 4 as thousands digit	Can be a decimal eg 4652.99, 4625.90
5	(a)	350	B1	cao	Accept trailing zeros eg 350.0
	(b)	7.7	B1	cao	Accept trailing zeros eg 7.70
	(c)	320	B1	cao	Accept trailing zeros eg 320.0
6		3 and 9	P1	for starting to list factors of 36 or multiples of 3 or odd numbers	Must be at least 3.
			A2	cao	In either order
			(A1	for one correct answer)	
7		(MYL) (MLY) (YML) (YLM) (LMY) (LYM)	M1	for at least 3 correct different combinations	for M1 ignore extras or repeats; accept words or unambiguous abbreviations
			A1	fully correct list with no extras or repeats	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	40 or tens	B1	cao	Accept trailing zeros, eg 40.0 Accept forty
2	odd square	B1	stating an odd square number eg 1, 9, 25, 49, 81, etc.	
3 (a)	4.56	B1	cao	Accept trailing zeros, eg 4.560
(b)	7300	B1	cao	Accept trailing zeros, eg 7300.0
4	4	B1	cao	
5	$\frac{31}{100}$	B1	cao	
6	$\frac{5}{7}, \frac{11}{15}, \frac{3}{4}, \frac{19}{25}$	M1 A1	conversion into decimals or percentages or other equivalent form, at least two conversions correct, or any three fractions in correct order cao	0.71(...), 0.73(...), 0.75, 0.76 Accept list in reverse order for this mark Accept expressed in equivalent decimals or percentages or any other appropriate form
7 (a)	$4m$	B1	cao	
(b)	$8np$	B1	cao	
8	263.2	M1 A1	for using the scale eg 14×18.8 or 14×18 or for the digits 2632 or an answer of 263 cao	



Paper: 1MA1/3F					
Question	Answer	Mark	Mark scheme	Additional guidance	
1 (i)	43.7	B1	cao		
(ii)	$\frac{5}{7}$	B1	$\frac{5}{7}$ oe	Accept any other equivalent fraction to $\frac{5}{7}$	
2	$\frac{3}{100}$	B1	cao		
3	1.2	B1	oe	Accept $\frac{12}{10}$ or $\frac{6}{5}$	
4	90	B1	cao		
5 (a)	Cuboid	B1			
(b)	12	B1	cao		
6 (a)	Cross at $\frac{1}{2}$	B1	cross at $\frac{1}{2}$	Accept any other marks near to $\frac{1}{2}$ if the intention is clear; do not accept if any other marks are shown.	
(b)	$\frac{2}{6}$	B1	$\frac{2}{6}$ oe	Acceptable equivalents are equivalent fractions to $\frac{2}{6}$ eg $\frac{1}{3}$ decimal 0.33(...) or 33(..)%	
7	1.94 m or 194 cm	M1 A1	for 188 or 0.06 or 194 or 1.94 1.94 m or 194 cm	Do not accept numerical answers without the correct unit shown.	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	500	B1	cao	
2	48 or 56	B1	for 48 or 56	Accept either or both. Do not award the mark if other numbers are shown with either.
3	1500	B1	cao	
4	9, 27	B1	cao	Do not award the mark if other numbers are shown.
5	$\frac{19}{100}$	B1	or any other equivalent fraction.	
6	16	M1 A1	for a complete method to find 20% of 80 eg 80×0.2 oe cao SC B1 for an answer of 64 or 96	
7	6	M1 A1	for interpreting the table to find the number of green counters ($26 + 7 (= 33)$) or the number of red counters ($16 + 11 (= 27)$) or the difference in circles ($26 - 16 (= 10)$) or squares ($11 - 7 (= 4)$) cao	$33 - 27 = 6$ $10 - 4 = 6$
8	39	M1 M1 A1	for finding one quarter of 52, eg $52 \div 4 (= 13)$ OR for finding the fraction to be filled, eg $1 - \frac{1}{4} \left(= \frac{3}{4} \right)$ oe for a complete method eg $52 - "13"$ or $"13" \times 3$ OR for $"\frac{3}{4}" \times 52$ cao	Accept equivalent decimals or percentages



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	-7, -4, -2, 1, 8	B1	for -7, -4, -2, 1, 8	Accept reverse order 8, 1 -2, -4, -7
2	8000	B1	cao	
3	23	B1	cao	
4	4.2	B1	for 4.2 or $\frac{21}{5}$ oe	
5	7776	B1	cao	
6	14	P1 P1 A1	for making a start to the process eg $14 \times 15 (= 210)$ or $14 \times 15 \times 6.50 (= 1365)$ or $1274 \div 6.50 (= 196)$ or $14 \times 15 \times 6.50 - 1274 (= 91)$ for a complete process eg $(14 \times 15 \times 6.50 - 1274) \div 6.50$ or $14 \times 15 - (1274 \div 6.50)$ cao	
7	$\frac{13}{20}$	M1 A1	for $20 - 7 (= 13)$ or $\frac{7}{20}$ oe or 0.65 or 65% for $\frac{13}{20}$ or equivalent fraction	
8 (a)	43	B1	cao	
(b)	- 20 or $\div 3$	B1	for $\div 3$ or - 20 or $\times \frac{1}{3}$ or + -20	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	3	B1	cao	
2	8	B1	cao	
3	$\frac{40}{100}$	B1	for $\frac{40}{100}$ or any equivalent fraction	
4	6.25	B1	for 6.25 oe	
5	-6, -4, -3, 0, 1, 2, 7	B1	for -6, -4, -3, 0, 1, 2, 7	accept reverse order
6 (a)	5	B1	cao	
(b)	5, 6	B1	cao	
7	$\frac{3}{4}$	M1 A1	for method to find fraction shaded, eg 12 out of 16 squares shaded or unsimplified answer eg $\frac{12}{16}$ or for $1 - \frac{1}{4}$ oe or for an answer of $\frac{1}{4}$ cao	May be expressed in a wide variety of ways.
8	78	P1 P1 A1	for process to find the number of boxes, eg $200 \div 25 (=8)$ or to find the cost of each tile, eg $9.75 \div 25 (=0.39)$ for complete process, eg "8" $\times 9.75$, "0.39" $\times 200$ cao	Could work in £ or in pence for P marks



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	30	B1	cao	
2	-10, -7, -2, 0, 1, 8	B1	Accept the reverse order, eg 8, 1, 0, -2, -7, -10	
3	0.09	B1	cao	Accept an answer of .09
4	330	B1	cao	
5	49	B1	cao	
6 (a)	Trapezium	B1	for trapezium	Accept incorrect spelling provided intention is clear Accept incorrect spelling provided intention is clear
(b)	Cylinder	B1	for cylinder	
7	14	M1 A1	for $42 \div 3$ cao	
8	Error identified	C1	error correctly identified Acceptable examples bar for brown is too high 16 should be 15 brown needs to be one less brown is wrong the graph does not match the table Not acceptable examples no title the gaps between the bars are wrong	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	$\frac{35}{100}$	B1	for $\frac{35}{100}$ oe	
2	7	B1	cao	
3	Two from 1, 2, 3, 4, 6, 12	B1	for any two correct factors from 1, 2, 3, 4, 6, 12	Do not allow any incorrect numbers
4	6m	B1	for 6m	
5	1.3	B1	cao	
6	drawing of a parallelogram	B2 (B1	for an accurate drawing of a parallelogram that is not a rectangle or a rhombus for a quadrilateral drawn with no lines of symmetry or for a quadrilateral drawn with rotational symmetry of order 2)	Accept freehand drawings with some inaccuracy if the intention is clear
7	29	P1 P1 A1	for a start to a process, eg. (total apples =) $86 + 75 + 92 (= 253)$ or (total oranges =) $68 + 80 + 76 (= 224)$ or differences each week, eg. (week 1) $86 - 68 (= 18)$ or (week 2) $75 - 80 (= -5)$ or (week 3) $92 - 76 (= 16)$ for complete process, eg “253” – “224” or “18” + “– 5” + “16” cao	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	$\frac{3}{10}$	B1	for $\frac{3}{10}$ oe	Accept equivalent fractions, eg $\frac{30}{100}$
2	9	B1	cao	
3	4	B1	cao	
4	10 or 12	B1	for 10 or 12	Accept both 10 and 12 given
5	15tw	B1	for 15tw	May be seen in different order
6	60	P3 (P2) (P1) A1	for complete process to find the total costings eg $23 + 33 + 24.5(0) + 24.5(0) + 15 + 10 + 10 (= 140)$ or for a complete process to find the total money left, eg. $200 - 23 - 33 - 24.5(0) - 24.5(0) - 15 - 10 - 10 (= 60)$, condone one error, eg one omission or one additional cost (P2) for process to find the total cost of all theme park tickets, eg $33 + 2 \times 24.5(0) (= 33 + 49 = 82)$ or for process to find the total cost of all meals, eg $15 + 2 \times 10 (= 15 + 20 = 35)$ or for process to find the total cost for the children, eg $2 \times 24.5(0) + 2 \times 10 (= 49 + 20 = 69)$ or for process to find total costs with just one child, eg $23 + 33 + 24.5(0) + 15 + 10 (= 105.5(0))$ (P1) for a start to a correct process, considering at least 2 costs eg $33 + 24.5(0) (= 57.5(0))$ or $2 \times 24.5(0) (= 49)$ or for start to a process to find money left, eg $200 - 23 (= 177)$ or $200 - 33 (= 167)$ A1 cao	All processes may be seen as part of subtractions to find money left Additions may include other elements for process marks, eg. $23 + 33 + 2 \times 24.5(0)$ May be any start to a correct process

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	18 000	B1	cao	
2	30	B1	cao	
3	reflex	B1	cao	
4	0.03, 0.1, 0.16, 0.2, 0.21	B1	for 0.03, 0.1, 0.16, 0.2, 0.21	accept 0.21, 0.2, 0.16, 0.1, 0.03
5	8	B1		Accept ± 8 or -8
6	1.5(0)	P1 P1 P1 A1	for $4 \times 1.30 (= 5.2(0))$ or $10 - 1.80 (= 8.2(0))$ for $10 - 1.80 - "5.20" (= 3)$ oe for $"3" \div 2$ cao SCB2 for answer (£)2.4(0)	Working could be in pence Condone answer £1.5(0)p



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
17	3.5	M1	for correct expansion of brackets, ie $8x - 10$ or dividing throughout by 2 as a first step to solve equation, eg $4x - 5 = 9$	For M marks step must be carried out not just intention shown. For example, if you see $\begin{array}{r} 2(4x - 5) = 18 \\ \div 2 \qquad \div 2 \end{array}$ Award M1 for: $4x - 5 = k$ with $k \neq 18, 36$
		M1	for isolating terms in x, eg $8x = 18 + 10$ or $4x = 9 + 5$	ft their equation of the form $ax \pm b = c$ For example, if you see $\begin{array}{r} 8x - 10 = 18 \\ +10 \qquad +10 \end{array}$ Award M1 for: $8x = k$ with $k \neq 8, 18$
		A1	for 3.5 or $3\frac{1}{2}$ oe or $\frac{7}{2}$ oe	
18	1	B1	cao	
19	Translation $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$	B1	for translation for $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$ NB: award no marks if more than one transformation is given	Do not accept 5 across, 4 down or 5 right, 4 down. Condone omission of brackets around vector. Do not accept vector given as coordinate.
20	$4n - 3$	B2	for $4n - 3$ oe	Accept a different variable eg $4x - 3$ Accept $u_n = 4n - 3$, $T = 4n - 3$ etc
		(B1	for $4n + k$ where $k \neq -3$ or is absent unambiguously shown)	$n = 4n - 3$ or $4n^{\text{th}} - 3$ gets B1 only



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	700	B1		Accept 7 hundreds
2	16	B1	cao	
3	Any two correct 1, 2, 4, 8, 16	B1	two correct and no incorrect	Allow more than two factors but all must be correct
4	-7, -3, 0, 4, 6	B1	accept in reverse order eg 6, 4, 0, -3, -7	
5	1.5	B1	oe eg $\frac{3}{2}$, $1\frac{1}{2}$	
6	(a) 5	B1	cao	
	(b) 17	B1	cao	
	(c) 8	B1	cao	
7	(a) Trapezium	B1	cao	Allow 88 – 92° for the right angle
	(b) Drawn	B1	for a right-angled triangle drawn	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	tenths or $\frac{7}{10}$	B1	for (7) tenths or $\frac{7}{10}$ or 0.7	Condone incorrect spelling provided the intention is clear
2	2.4	B1	oe eg $\frac{12}{5}$	
3	$\frac{19}{100}$	B1	oe eg $\frac{190}{1000}$	
4	$\frac{4}{10}$	B1	oe eg $\frac{2}{5}$, 0.4, 40%	Accept $\frac{4}{10}$ positively indicated in the list (as long as answer line is blank)
5	Two correct factors	B1	for 2 correct factors from 1, 2, 4, 8, 16, 32 and no incorrect factors	Accept one correct product
6	28	P1 P1 A1	for a process to work out the value of the £20 notes, eg $6 \times 20 (= 120)$ oe for a process to work out the value of the £10 notes, eg $400 - "120" (= 280)$ oe allow £28	Build up processes are allowed. Condone one error in the build-up process. If 28 seen but 10 or 280 on answer line award P2A0 eg '28 notes of £10' then 10 or 280 on answer line
7 (a)	Mark at $\frac{1}{6}$	B1	for mark at $\frac{1}{6}$	Accept indications other than a cross, eg an arrow pointing to the correct position.
(b)	Mark at $\frac{2}{6}$	B1	for mark at $\frac{2}{6}$	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	CB, CF, CS, TB, TF, TS, LB, LF, LS	B2 (B1)	for fully correct list with no repeats for at least 4 correct combinations, condone repeats and incorrect combinations)	Accept unambiguous abbreviations Accept CB or BC etc
9 (a)	-2, 1	B1	cao	Accept without label provided unambiguous, ignore any lines drawn Accept without label provided unambiguous, ignore any lines drawn
(b)	Point marked at (1, 2)	B1	cao	
(c)	Point marked at (5, 0)	B1	cao	
10	No with reason	C1	No with reason Acceptable reasons: No, the cube root of 27 is 3 (not 9) No, the answer is 3 No, $9 \times 9 \times 9$ is not 27 No, $9 \times 9 \times 9$ is 729 No, $3 \times 3 \times 3$ is 27 No, $27 \div 3 = 9$ and $9 \div 3 = 3$ No, he needs to divide by 3 again No, because you don't divide by 3 for cube root No, 9×9 is 81 which is already more than 27 Not acceptable reasons: No, the cube root is not 9 3 divided by 27 is 9 No because a cube number is a number times by itself 3 times No, because you don't divide by 3	'No' may be implied by an equivalent statement eg 'Jason is wrong' or 'He is not correct'

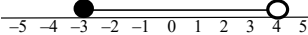


Paper: IMA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
18	Jan's store (supported)	P1	process to reduce £5 by 20% (= £4) or increase 400 by 30% (= 520)	May work in pence throughout Accept any correct appropriate percentage process
		P1	process to reduce £5 by 20% (= £4) and increase 400 by 30% (= 520)	
		P1	(dep P2) process to find comparable values, eg $400 \div "4"$ and $"520" \div 5$	May use £/g or any other comparable values
		C1	'Jan's store' fully supported by correct comparative values, eg 100 (g/£) and 104 (g/£)	Do not award without correct comparable values and full working.
19	Shape drawn	B2	for shape with vertices at (4, -3), (5, -4), (5, -5), (4, -5)	Shape does not have to be shaded. Allow some tolerance on vertices as long as they are nearest to the desired points.
		(B1)	for rotation of 180° about wrong centre	This is shown by the orientation of the shape.
20	9	M1	for a correct first step, using the laws of indices to simplify eg 3^2 or $3^{7+ -2}$ or 3^{7-3} or 3^{-2-3} OR for using exact values, eg $2187 \times \frac{1}{9}$ (= 243) or $2187 \div 27$ (= 81) or $\frac{1}{27 \times 9}$ (= $\frac{1}{243}$)	
		A1	cao	
21 (a)	6 or -6	M1	for $12^2 + 2 \times -3 \times 18$ (= 36)	Terms may be partially evaluated.
		A1	for 6 or -6, accept ± 6	Only one value is required for full marks
(b)	$s = \frac{v^2 - u^2}{2a}$	M1	for subtracting u^2 from both sides or dividing all terms by $2a$ as the first step	Must see this step carried out, not just the intention shown
		A1	$s = \frac{v^2 - u^2}{2a}$ oe	

Paper: IMA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
14 (a)	14	B1	for 14	
(b)	Explanation	C1	for explanation Acceptable examples she divided by 2 but should have multiplied by 2 there are 96 halves in 48 $48 \times 2 = 96$ Not acceptable examples $24 \times 2 = 48$	
15 (a)	8	B1	cao	
(b)	125	B1	cao	
16 (a)	$10m - 15$	B1	for $10m - 15$ oe	Accept any reversing of order in the expression
(b)	$3(n + 4)$	B1	for $3(n + 4)$ oe	Accept any answer in reverse order
17 (i)	Maxine with bigger number of trials	C1	for Maxine with reason Acceptable examples She throws the coin more times than Stuart Not acceptable examples Maxine throws it 50 times She gets more Tails Stuart (he)	
(ii)	$\frac{37}{60}$	B1	for $\frac{37}{60}$ oe	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
13 (a)	10ab	B1	cao	Accept 1y for 1 or 2 marks
	8x + y	M1	for 8x or y	
		A1	for 8x + y	
14	345	M1	for complete method with relative place value correct including addition of all the appropriate elements of the calculation. 230 115 345 230 115 345 230 115 345 200 + 30 + 100 + 15 = 345 23 + 23 + 23 + 23 + 23 = 115; 115 + 115 + 115 = 345	Accept all equivalent methods if complete. Partitioning methods may show a complete method which has been broken down into multiple stages. Multiple addition of 23 (or 15) acceptable if the correct number added is shown, and an attempt at addition is clear.
		A1	cao	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
20	(a) c^3	B1	cao	
	(b) d^{12}	B1	cao	
21	(a) $x > -1$	B1	cao	
	(b) Diagram drawn	C2 (C1)	for a fully correct diagram, eg 	
22	(a) 12	M1	for a correct factor tree for either 60 or 84 with no more than one arithmetic error or for listing factors of 60 or 84, at least 4 correct for either (with no more than 1 incorrect in either list), could be in factor pairs or for the prime factors of 60 (2, 2, 3, 5) or 84 (2, 2, 3, 7)	Condone the use of 1 in any factor tree 60: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 84: 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84
		A1	for 12 or $2 \times 2 \times 3$ oe SC B1 for answer of 4 or 6, if M0 scored	
	(b) 120	M1	for a correct factor tree for either 24 or 40 with no more than one arithmetic error or for at least 3 multiples of both 24 and 40 (can include 24 and 40) or for the prime factors of either 24 (2, 2, 2, 3) or 40 (2, 2, 2, 5) or for a common multiple from their lists ($\neq 120$)	Condone the use of 1 in any factor tree 24: 24, 48, 72, 96, 120, ... 40: 40, 80, 120, ... For the list not containing 120, accept the first 3 correct multiples or one error in the first 4 multiples
		A1	for 120 or $2 \times 2 \times 2 \times 3 \times 5$ oe	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
19	$2^2 \times 5^3$	M1 M1 A1	for a complete method to find prime factors; could be shown on a complete factor tree with no more than one error or by division by prime factors with no more than one error for complete factorisation, eg 2, 2, 5, 5, 5 for $2^2 \times 5^3$	Condone the inclusion of 1 for the method marks Could be shown on a fully correct factor tree
20 (a)	$3\frac{17}{20}$	M1 A1	for finding two fractions with a correct common denominator (multiple of 20), with at least one correct corresponding numerator, eg $\frac{12}{20}, \frac{5}{20}$ or $\frac{32}{20}, \frac{45}{20}$ for $3\frac{17}{20}$ or an equivalent mixed number SC: B1 for 3.85 if M0 scored	May be from $\frac{3}{5}$ and $\frac{1}{4}$ or from $\frac{8}{5}$ and $\frac{9}{4}$
(b)	shown	M1 A1	for $\frac{8}{3} \times \frac{1}{6}$ oe or $\frac{4}{9} \times \frac{6}{1}$ oe or $\frac{8}{3} \times \frac{9}{4}$ oe for unsimplified fraction which could lead to $\frac{4}{9}$, eg $\frac{8}{18}$ or for $\frac{4}{3} \times \frac{1}{3}$ or $\frac{24}{9} \div 6$ or for unsimplified fraction which could lead to $2\frac{2}{3}$, eg $\frac{24}{9}$ or for unsimplified fraction which could lead to 6, eg $\frac{72}{12}$	
21	2^6	M1 A1	for the start of a method of simplification, eg $2^{-5+8} (= 2^3)$ or $2^{-5 \times 2} (= 2^{-10})$ or $2^{8 \times 2} (= 2^{16})$ cao SC B1 for answer of 64 or 8^2 or 4^3 if M0 scored.	



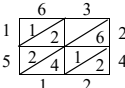
Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
29	16	M1 A1	for simplifying using a correct rule of indices as a first step eg 4^{9-6} (= 4 ³ oe) or 4^{-6-1} (= 4 ⁻⁷ oe) or 4^{9-1} (= 4 ⁸ oe) or $\frac{4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4}{4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4}$ or 4 ² cao	
30	$\frac{1}{2}$	B1	for $\frac{1}{2}$ oe	
31	0.06	M1 A1	for 0.2×0.3 oe 0.06 oe	Accept any equivalent fraction or 6%



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
26	(a)	B1	cao	
	(b)	M1	for any two of $12 \div 6 (= 2)$, $x^{7-3} (= x^4)$, $y^{3-1} (= y^2)$ in a product or written as a fraction with complete and correct cancelling of at least two terms	
		A1	cao	
27	(i)	P1	for a process to draw a bearing of 070° , eg. a line drawn 70° from the North line at P	Accept a line of any length as long as the intention is clear. Award P3 for Q shown in the correct place on the diagram. 4.5 scores 2 marks provided there is a link to $12 \times 1.5 (= 18)$ Award no marks if no supportive processes Award no marks if no supportive processes Award A0A0 if Q is not in the correct place
	(ii)	P1	for a process to work out the distance PQ , eg. $12 \times 1.5 (= 18)$	
		P1	(dep previous P1) for the process to use the given scale eg. " 18 " $\div 4 (= 4.5$ cm)	
		A1	(dep P3) for distance in the range 20 to 23	
		A1	(dep P3) for bearing in the range 317 to 330	

Paper: 1MA1/2F				
Question	Working	Answer	Mark	Notes
21 (a)		6	B1	cao
(b)		5	B1	cao
(c)		Shown	M1	for writing 100^a or 1000^b as a power of 10 ($=10^{2a}$ or 10^{3b}) or 10^{2a+3b} or $100 = 10^2$ and $1000 = 10^3$
			C1	for complete chain of reasoning leading to conclusion



Paper: 1MA1/1F													
Question	Answer	Mark	Mark scheme	Additional guidance									
18	15.12	M1	for a complete method with relative place value correct including an intention to add all the appropriate elements of the calculation	252 1260 1512  <table border="1"><tr><td></td><td>60</td><td>3</td></tr><tr><td>20</td><td>1200</td><td>60</td></tr><tr><td>4</td><td>240</td><td>12</td></tr></table> 1200 + 60 + 240 + 12 = 1512		60	3	20	1200	60	4	240	12
	60	3											
20	1200	60											
4	240	12											
		A1	for digits 1512										
		A1	(dep on M1) for correct placement of the decimal point into their final answer										
19	(a)(i)	B1	cao										
	(ii)	B1	oe										
	(b)	M1	for a correct first step using a rule of indices, eg $2^{5+4}(=2^9)$ or $2^{5-3}(=2^2)$ or $2^{4-3}(=2^1)$ or for $2 \times 2 \times 2 \times 2 \times 2 \times 2$ or 64										
		A1	for 2^6	Accept $n = 6$									

Paper: 1MA1/2F					
Question		Answer	Mark	Mark scheme	Additional guidance
20	(a)	m^7	B1	cao	
	(b)	$125n^3p^9$	B2	cao	Allow multiplication signs
			(B1)	for 2 of 3 terms correct in a single product)	$125n^3p^x$ or $125n^3p^9$ where $x \neq 0$ or an^3p^9 where a is a number
	(c)	$8q^6r^3$	B2	cao	Allow multiplication signs
			(B1)	for 2 of 3 terms correct in a single product)	$8q^6r^x$ or $8q^6r^3$ where $x \neq 0$ or aq^6r^3 where a is a number
21	(a)	280	M1	for listing at least 3 multiples of both 40 and 56 OR finds the prime factors of both 40 and 56	40, 80, 120, ... 56, 112, 168, ... OR 2,2,2,5 and 2,2,2,7
			A1	cao	
	(b)	60	B1	60 or $2^2 \times 3 \times 5$ oe	2^2 , 3, 5 not enough ie must be a product
22		$y = 3x - 6$	M1	for a correct method to find the gradient of the line, or $m = 3$ OR identifies -6 as the intercept in words or in a partial equation OR $y - b = m(x - a)$ where $m \neq 3$ and (a, b) is a correct coordinate	Just ringing -6 is insufficient
			M1	for $y = 3x + c$ or (L=) $3x - 6$ or $y = "3"x - 6$ OR $y - y_1 = 3(x - x_1)$ or $y - b = "3"(x - a)$ where (a, b) is a correct coordinate	Award of this mark implies the first M1 c must be seen either as a letter or a number
			A1	accept $y = 3x + -6$ oe	



Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
24		147	P1 P1 P1 A1 B1	starts process, eg uses x and $x + 7$ starts to work with at least 6 correct sides, may be on the diagram or in an expression (dep on previous P1) gives a correct expression for the perimeter, eg $x + x + 7 + x + 7 + x + 7 + x + x + 7 + x + 7 + x + 7$ or adds at least 6 correct sides and equates to 70 for width = 3.5 oe and length = 10.5 oe ft (dep P2) for correct area for their x
25		0.0007452	M1 A1	for digits 7452 seen cao
26 (a)		Mel (supported)	B1	Mel with reference to greatest number of throws
(b)		$\frac{2}{9}$	M1 A1	selects overall total and multiplies P(point up)×P(point down) eg $\frac{50}{150} \times \frac{100}{150}$ oe (accept $\frac{14}{45} \times \frac{31}{45}$ or $\frac{27}{80} \times \frac{53}{80}$ or $\frac{9}{25} \times \frac{16}{25}$) for $\frac{2}{9}$ oe



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)	10	M1	for a start of method to find Bispah's share, eg $2.50 \times 8 (= 20)$ or $\frac{1}{2} \div \frac{1}{8} (= 4)$	Accept 10.00 Accept working in pence, or in £ given as a decimal oe NB: award this mark if the working is seen in part (a) Accept 3:1 (correct answer in reverse order) which can also be an equivalent ratio to 3:1 Award full marks for 1 : 3 or an equivalent ratio. If an equivalent ratio to 1:3 is shown and then simplified incorrectly award full marks.
		A1	cao	
(b)	1 : 3	P1	for a process to find Chan's share, eg "20" – 2.5 – [Bispah's money] (=7.5) or $1 - \frac{1}{8} - \frac{1}{2} (= \frac{3}{8})$	
		P1	for a correct ratio eg 2.5 : "7.5" or $\frac{1}{8} : \frac{3}{8}$ or 3 : 1 oe	
		A1	for 1 : 3 oe eg 5 : 15	
17	6	P1	for a process to set up an equation in x, eg $\frac{1}{2} \times 3x \times 3x = 162$	Must be a complete equation
		P1	for a process to simplify to x^2 eg $x^2 = 162 \times 2 \div 9$ or $x^2 = 36$	Can fit their equation if a quadratic
		A1	cao	
18	2.3×10^6	M1	for 2.3×10^n where $n \neq 6$ or 23×10^5 or 2300000 or 2645000000 and 1150 seen	2300000 could be written as 2.3 million
		A1	cao	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
27	(a) 5.62×10^{-3}	B1	cao	
	(b) 1452	B1	cao	
28	(a) 24, 39	B1	cao	SC: B1 for 3, 5, 8 seen if M0 scored
	(b) $8a$	M1 A1	for a complete method to find the next 2 terms, eg. $a + 2a (= 3a)$ and $2a + "3a" (= 5a)$ $8a$ oe	
29	$\begin{pmatrix} -2 \\ 1 \end{pmatrix}$	M1 A1	for $4 - 2 \times 3 (= -2)$ or $5 - 2 \times 2 (= 1)$ seen as a calculation OR for $\begin{pmatrix} 4 \\ 5 \end{pmatrix} - \begin{pmatrix} 2 \times 3 \\ 2 \times 2 \end{pmatrix}$ OR for $\begin{pmatrix} -2 \\ b \end{pmatrix}$ where $b \neq 1$ or $\begin{pmatrix} a \\ 1 \end{pmatrix}$ where $a \neq -2$ cao	May be in a column vector

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
25 (a)	F	B1	cao	
(b)	D	B1	cao	
26	Shown (supported)	M1 M1 A1	for method to find at least two terms, eg $2 \times 4^2 - 1 (= 31)$ and $40 - 3^2 (= 31)$ for generating at least three correct terms of each sequence for generating at least the terms 1, 7, 17, 31, 49 of the first sequence and at least the terms 39, 36, 31, 24, 15, 4 of the second sequence	1 7 17 31 49 71 97 127 161 199 39 36 31 24 15 4 -9
27	4.56×10^{-2}	M1 A1	for $0.000000342 \div 0.0000075$ OR for 0.0456 oe eg 0.456×10^{-1} or 45.6×10^{-3} or $\frac{57}{1250}$ OR for an answer of 4.56×10^n cao	
28	6	M1 M1 A1	for $720 \div 40 (= 18)$ or $720 \div 30 (= 24)$ for a complete process eg $(720 \div 30) - (720 \div 40)$ or " 18 " $\times$ $\frac{4}{3}$ – " 18 " or " 24 " – " 24 " $\times$ $\frac{3}{4}$ cao	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
26	20 or 24 or 168	B1	for identification of the range of the girls (20) or the range (24) or the median (168) of the boys	
	Comparison	C2	for a correct comparison of medians and a correct comparison of ranges supported by correct figures. eg the median height for girls (165) is less than the median height for boys (168) and the range for girls (20) is less than the range for boys (24) At least one comparison must be in context referring to height or quoting cm.	Simply quoting values for median, range is insufficient; they must be compared.
		(C1	for a correct comparison of medians or a correct comparison of ranges that could fit their incorrect figure(s))	Context not necessary for C1
27	450	M1	for $18 \div 3 (=6)$	Ignore units
		M1	for substitution eg. $75 = \frac{F}{6}$ or $75 \times "6"$	
		A1	cao	
28	0.000672, 67.2×10^{-4} 6.72×10^5 672×10^4	B2	cao	Accept correct numbers in any form
		(B1	for correct conversions to same format, condoning one error. or for 3 numbers in the correct order (ignoring one) or for all 4 numbers listed in reverse order)	



Paper: 1MA1/3F																
Question	Answer	Mark	Mark scheme	Additional guidance												
19	7 cm by 8 cm rectangle drawn	M1 M1 C1	for interpreting the front elevation, eg length = 8 or height = 4 For beginning to draw plan, eg. rectangle drawn with one side length of 8 cm or one of 7cm or for interpreting front elevation to find missing dimension eg $(224 \div "8") \div "4" (= 7)$ for correct plan drawn	May be seen on diagram or in part of a calculation May be drawn in any orientation												
20 (a)	4.68×10^5	B1	cao													
(b)	0.000 503 7	B1	cao													
21	80	M1 A1	for complete method, eg 200×0.4 or for $\frac{80}{200}$ for the answer cao													
22 (a)	24.6	M1 M1 A1	for finding 5 products within intervals (including end points) with not more than one error, may be seen near table. eg $2 \times 12.5 (= 25)$, $8 \times 17.5 (= 140)$, $13 \times 22.5 (= 292.5)$, $21 \times 27.5 (= 577.5)$, $6 \times 32.5 (= 195)$ or for 1230 for $\Sigma fx \div \Sigma f$ eg $("25" + "140" + "292.5" + "577.5" + "195") \div "50"$ or $"1230" \div "50"$ for 24.6 oe	<table><tr><th>Min fx</th><th>Max fx</th></tr><tr><td>20</td><td>30</td></tr><tr><td>120</td><td>160</td></tr><tr><td>260</td><td>325</td></tr><tr><td>525</td><td>630</td></tr><tr><td>180</td><td>210</td></tr></table> Σfx must come from 5 products, fx within intervals (including end points)	Min fx	Max fx	20	30	120	160	260	325	525	630	180	210
Min fx	Max fx															
20	30															
120	160															
260	325															
525	630															
180	210															



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
27	3.125×10^7	M1	for $(k =) (1.25 \times 10^{-12}) \div (4 \times 10^{-20})$ or for the digits 3125	Condone missing brackets on division 3.1×10^7 or 3.12×10^7 or 3.13×10^7 will score M1A0
		A1	cao	
28	7.96	M1	for method to find volume of cylinder, eg $\pi \times 3^2 \times 10$ ($= 90\pi$ or $282.74\dots$)	[volume] is any value they clearly think is the volume of the cylinder but must come from a calculation and must not be 3 or 10
		M1	for method to find density, eg $2250 \div \text{“}282.74\dots\text{”}$ or $2250 \div [\text{volume}]$	
		A1	for answer in the range 7.95 to 7.96	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
18 (a)	340 200	B1	cao	
(b)	8.026×10^{-1}	B1	cao	
19	Drawn	B2 (B1	for a correct construction with all relevant arcs drawn for all relevant arcs drawn or for a bisector within guidelines but with no or insufficient arcs)	
20 (a)	(0.3) 0.7 0.3 0.7 0.3 0.7	B2 (B1	all probabilities correctly placed for 0.7 correctly placed for Game 1)	Accept equivalent fractions or percentages for probabilities
(b)	0.49	M1 A1	for a correct method, ft their tree diagram eg 0.7×0.7 only oe, ft their tree diagram	ft their diagram provided probabilities are less than 1 An answer of $\frac{0.49}{1}$ scores M1A0 unless 0.49 seen



Paper 1MA1: 2F				
Question	Working	Answer	Mark	Notes
14 (a)		$5(1 - 2m)$	B1	cao
			M1	for $2a(ab + 3b^2)$ or $2b(a^2 + 3ab)$ or $ab(2a + 6b)$ or $2ab$ (2 term expression with terms in a or b or ab , can include constants), eg $2ab(1a + 3ab)$, $2ab(1 + 3b)$
			A1	for $2ab(a + 3b)$
15 (a)		0.47	B1	
			M1	for correct value but not in standard form, eg $22.8 \times 10^{3+5}$, 228×10^7 , $2\,280\,000\,000$ or for 2.28×10^9 , $n \neq 9$
			A1	cao
16		T shown on the map	C1	for showing a perpendicular bisector or point T equidistant from points B and C .
			C1	for a circle or arc of circle of radius 2.5 cm or point T 2.5 cm from point A
			C1	for T shown in correct position



Paper 1MA1: 1F				
Question	Working	Answer	Mark	Notes
19		180, 210, 375, 3	M1	for $\frac{24}{16}$ or 1.5 or $\frac{16}{24}$ or 0.5 of any figure in the recipe calculated or amount of any ingredient for 1 flapjack or 3 (tablespoons)
			M1	for method to scale at least one ingredient in grams eg 120×1.5 or 140×1.5 or 250×1.5
			A1	for all quantities correct
20		Ami	M2	for an approximate calculation eg $\frac{600}{16+5}$ or $\frac{600}{21}$ or $\frac{600}{20}$ or $\frac{600}{20+5}$ or $\frac{600}{25}$ or $\frac{600}{25+5}$ or $\frac{600}{30}$ or $\frac{595}{20}$
		with estimate	(M1	for using 600 or 5 or 4)
			C1	Ami's answer /27.1115 is closest with accurately calculated figure from approximation
21		1.8×10^{-3}	M2	for $\frac{6 \times 10^{-2} \times 3 \times 10^{-4}}{1 \times 10^{-2}}$ or 18×10^{-4} or 0.0018 as the answer
			(M1	for 6×0.0003 or 0.06×0.03 or 1.8×10^0 ($n \neq -3$) or $0.000018 \div 0.01$ or rewriting one number in standard form)
			A1	cao



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
28 (a)	3.246×10^7	B1	cao	Decision eg "No" may be seen by the question. "She is incorrect" is equivalent to "no"
(b)	0.00496	B1	cao	
(c)	No with explanation	C1	No and explanation that B is bigger as the power of 10 is bigger. Acceptable examples She is incorrect as 10^8 is smaller than 10^9 No, because B has more digits than A No, A is millions but B is billions No, if you subtract A from B the answer is positive (but if you subtract B from A the answer is negative) A= 621200000, B=4730000000, B is bigger No because she did not take into account standard form No as when you find the ordinary number B is greater than A Not acceptable examples Yes... A = 5 zeros after the number where as B = 7 zeros after the number No as 4.73×10^9 is one more than 6.212×10^8 6.212 is to the power of 8 and 4.73 is to the power of 9 so there is an extra digit Asma is wrong because she has more numbers behind the decimal point which means that it will be bigger than A No B has more zeros	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
29 (a)	0.000675	B1	cao	If the answer (for 2 marks) is seen in working and then rounded or truncated, award full marks.
(b)	6.592×10^5	M1	for 10.5472×10^3 oe or 1.6×10^8 oe or 2.575×10^{-1} oe or for 6.592×10^n where $n \neq 5$ or for 6.59×10^5 or for 6.6×10^5 or for 659200 oe	
		A1	cao	
30 (a)(i)	$\begin{pmatrix} 1 \\ 5 \end{pmatrix}$	B1	for $\begin{pmatrix} 1 \\ 5 \end{pmatrix}$	Need not be shown in brackets at this stage
(ii)	$\begin{pmatrix} 0 \\ 5 \end{pmatrix}$	M1	for substitution of values eg $\begin{pmatrix} 2 \times 2 - 4 \\ 3 \times 2 - 1 \end{pmatrix}$ oe OR for $\begin{pmatrix} 0 \\ b \end{pmatrix}$ or $\begin{pmatrix} a \\ 5 \end{pmatrix}$ where a, b are integer values.	
		A1	for $\begin{pmatrix} 0 \\ 5 \end{pmatrix}$	
(b)	correct vector drawn	C1	for a correct vector drawn from point P	Need not be labelled but do not award if there is any ambiguity.



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
23	1.037×10^4	M1 A1 A1	for 570 or 9800 or 0.57×10^3 or 98×10^2 for 10370 oe eg 10.37×10^3 or 103.7×10^2 for 1.037×10^4	
24	12	P1 P1 or P1 or A1	for (interior angle =) $(180 \div 3) + (360 \div 4)$ (= 150) for (exterior angle =) $180 - "150"$ (= 30) or for $"150" = \frac{(n-2) \times 180}{n}$ oe for $360 \div "30"$ or for a correct process to solve the equation as far as $"30"n = 360$ cao	150 may be seen on diagram. May be seen on diagram Exterior angle of 30 implies P1P1 A correct answer with no supportive working gets 0 marks Minimum supportive working is P1P1 or Trials of interior angle sum Finding $1800 \div 150 = 12$ oe with 12 as answer scores P1P1P1A1



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
26 (a)	$10x^2 - 11x - 6$	M1	for 3 out of no more than 4 terms correct with correct signs or 4 correct terms ignoring signs	$10x^2 - 15x + 4x - 6$ NB: $10x^2 - 11x$ and $-11x - 6$ are indicative of 3 correct terms.
		A1	cao	
	$(x + 1)(x + 3)$	M1	for $(x \pm 1)(x \pm 3)$ or for $(x + a)(x + b)$ where either $ab = 3$ or $a + b = 4$	
		A1	cao	
27 (a)	7.547×10^{-5}	B1	cao	
	34200	B1	cao	
	3.082×10^{15}	M1	for $\frac{23000 \times 6700}{0.00000005}$	
			OR for one calculation eg 1.541×10^8 or 154 100 000 or 4.6×10^{11} or 1.34×10^{11}	
		A1	for 3.082×10^{15} oe	
				Answer could be given as an ordinary number.

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
22	12.85 or 12.86 or 13.5(0)	P1	for $9 + 2 + 1$ (=12)	Award this mark for sight of 4500, 1000 or 500
		P1	for working out how many lots of 175g are needed eg $6000 \div "12" \times 2 \div 175$ (=5.71..)	Process may lead to 5 or 6 instead of 5.71
		P1	for a complete process eg $"5.71..." \times 2.25$ (=12.857..)	"5.71..." (ft) or a figure rounded or truncated eg "6"
		A1	for 12.85 or 12.86 or 13.5(0)	
23 (a)	450 000	B1	cao	
		B1	cao	
		M1	for 4730 oe or for 4.73×10^n where $n \neq 3$	
		A1	cao	



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	30	P1	for $160 \div (3+7) (= 16)$ or $\frac{3}{3+7} (= \frac{3}{10})$	Award no marks for a correct answer with no supportive working
		P1	for “16” $\times 3 (= 48)$ or “ $\frac{3}{10}$ ” $\times 160 (= 48)$	
		P1	for a correct step using 48 eg “48” $\div 8 (= 6)$ or “48” $\times 25 \div 100 (= 12)$ or (indep) for combining $\frac{1}{8}$ and 25%, eg $\frac{1}{8} + \frac{1}{4} (= \frac{3}{8})$ or “0.125” + “0.25” $(= 0.375)$ or “12.5”(%) + 25(%) $(= 37.5(\%))$	
		P1	for a complete process to find the number of petrol cars, eg “48” – “6” – “12” oe or $(1 - \frac{3}{8}) \times 48$ oe or $\frac{3}{10} \times (1 - \frac{3}{8}) \times 160$ oe	
		A1	cao SC B2 for an answer of 100 if P0 scored	
26 (a)	0.00163	B1	cao	
(b)	4.38×10^5	B1	cao	
(c)	2.4×10^{-1}	M1	for $4 \times 6 \times 10^{3-5}$ or 0.24 oe eg 24×10^{-2} or 2.4×10^n where $n \neq -1$	
		A1	cao	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
27	648	M1 A1	for substitution into density formula eg 9×72 or $9 = \frac{m}{72}$ cao	
28 (a)	1 : 50	M1 A1	for an equivalent ratio eg $9 : 450$ or $9 : 4.5 \times 10^2$ or $90000 : 4500000$ oe or for $4500000 \div 90000$ or $\frac{4500000}{90000}$ (=50) For 1 : 50, accept $n = 50$	
(b)	56250×10^{-3} 0.005625×10^5 5625 5.625×10^4	M1 A1	for writing numbers correctly in a common format eg 56250, 56.25, 562.5 or a correct list with one error or correct list but in reverse order for correct list	Count an omission as one error. Accept alternative indications of the correct order.



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
23 (a)(i)	53 000	B1	cao	
	(ii) 0.000 074	B1	cao	
	(b) 3.42×10^7	M1	for 9 700 000 + 24 500 000 (= 34 200 000) or 3.42×10^n ($n \neq 7$) oe or 3.4×10^7 or correct answer in incorrect form eg 34.2×10^6 or both in a form ready for addition, eg $9.7 \times 10^6 + 24.5 \times 10^6$	
		A1	cao	

