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

Fractions, Decimals & Percentages (N2)

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

53 questions · 171 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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QUESTIONS

53 questions · 171 marks · 3 sub-topics

SUB-TOPIC N2a

FRACTIONS

Sub-topic N2a · 11 questions · 38 marks · lowest tariff first



9 Work out $3\frac{1}{2} \times 1\frac{3}{5}$

Give your answer as a mixed number in its simplest form.

(Total for Question 9 is 3 marks)



- 2 There are 60 people in a choir.
Half of the people in the choir are women.

The number of women in the choir is 3 times the number of men in the choir.
The rest of the people in the choir are children.

the number of children in the choir : the number of men in the choir = $n : 1$

Work out the value of n .
You must show how you get your answer.

$n = \dots\dots\dots$

(Total for Question 2 is 4 marks)

- 3 Work out $1\frac{3}{4} \times 1\frac{1}{3}$

Give your answer as a mixed number.

(Total for Question 3 is 3 marks)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** The first five terms of an arithmetic sequence are

1 4 7 10 13

Write down an expression, in terms of n , for the n th term of this sequence.

(Total for Question 1 is 2 marks)

- 2** Show that

$$2\frac{1}{3} \times 3\frac{3}{4} = 8\frac{3}{4}$$

(Total for Question 2 is 3 marks)

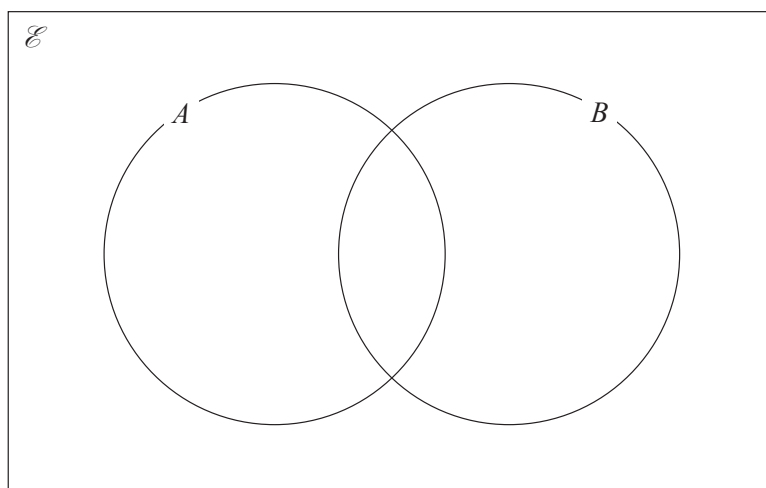


2 $\mathcal{E} = \{\text{even numbers less than 19}\}$

$$A = \{6, 12, 18\}$$

$$B = \{2, 6, 14, 18\}$$

Complete the Venn diagram for this information.



(Total for Question 2 is 3 marks)

3 Work out $4\frac{1}{5} - 2\frac{2}{3}$

Give your answer as a mixed number.

(Total for Question 3 is 3 marks)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Work out $8.46 \div 0.15$

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

2 Work out $7\frac{3}{8} - 2\frac{1}{2}$

Give your answer as a mixed number.

.....
(Total for Question 2 is 3 marks)



2 (a) Work out $3\frac{4}{5} - 1\frac{2}{3}$

.....
(2)

Kevin was asked to work out $2\frac{1}{3} \times \frac{5}{8}$

Here is his working and his answer.

$$\begin{aligned} 2\frac{1}{3} \times \frac{5}{8} &= \frac{7}{3} \times \frac{5}{8} \\ &= \frac{35}{24} \\ &= 1\frac{9}{24} \end{aligned}$$

Kevin's answer is wrong.

(b) What mistake has Kevin made?

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

.....
(Total for Question 2 is 3 marks)



- 5 This year the total weight of potatoes grown on a farm is $\frac{1}{5}$ less than last year.

This year the total weight of potatoes grown is 8000 tonnes.

Work out the total weight of potatoes grown last year.

..... tonnes

(Total for Question 5 is 3 marks)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 (a) Work out $2\frac{1}{7} + 1\frac{1}{4}$

.....
(2)

(b) Work out $1\frac{1}{5} \div \frac{3}{4}$

Give your answer as a mixed number in its simplest form.

.....
(2)

(Total for Question 1 is 4 marks)



2 (a) Work out $1\frac{3}{5} + 2\frac{1}{4}$

Give your answer as a mixed number.

.....
(2)

(b) Show that $2\frac{2}{3} \div 6 = \frac{4}{9}$

(2)

(Total for Question 2 is 4 marks)



The pass mark for the test was 40

Sian says,

“30% of the 60 students passed the test.”

(b) Is Sian correct?

You must show how you get your answer.

(3)

(Total for Question 9 is 6 marks)

10 (a) Work out $25^{\frac{1}{2}} \times 8^{\frac{1}{3}}$

(b) Find the value of $\left(\frac{1}{32}\right)^{\frac{3}{5}}$

(2)

(2)

(Total for Question 10 is 4 marks)



3 (a) Work out $3\frac{1}{2} - 1\frac{1}{6}$

Give your answer as a mixed number.

(b) Show that $5\frac{1}{4} \div 2\frac{1}{3} = 2\frac{1}{4}$

(2)

(3)

(Total for Question 3 is 5 marks)



SUB-TOPIC N2b

DECIMALS & CONVERSIONS

Sub-topic N2b · 18 questions · 54 marks · lowest tariff first



13 Ted is trying to change $0.\dot{4}\dot{3}$ to a fraction.

Here is the start of his method.

$$x = 0.\dot{4}\dot{3}$$

$$10x = 4.\dot{3}\dot{4}$$

$$10x - x = 4.\dot{3}\dot{4} - 0.\dot{4}\dot{3}$$

Evaluate Ted's method so far.

(Total for Question 13 is 1 mark)



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

 $0.2\dot{4}\dot{6}$ $0.24\dot{6}$ $0.\dot{2}4\dot{6}$ 0.246

(Total for Question 8 is 2 marks)

- 9 James and Peter cycled along the same 50 km route.

James took $2\frac{1}{2}$ hours to cycle the 50 km.

Peter started to cycle 5 minutes after James started to cycle.

Peter caught up with James when they had both cycled 15 km.

James and Peter both cycled at constant speeds.

Work out Peter's speed.

..... km/h

(Total for Question 9 is 5 marks)



15 Prove algebraically that $0.7\dot{3}$ can be written as $\frac{11}{15}$

(Total for Question 15 is 2 marks)



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

Give your answer as a power of 2

(Total for Question 3 is 2 marks)

4 Work out 0.004×0.32

(Total for Question 4 is 2 marks)



16 Using algebra, prove that $0.\dot{1}\dot{3}\dot{6} \times 0.\dot{2}$ is equal in value to $\frac{1}{33}$

(Total for Question 16 is 3 marks)



14 The ratio $(y + x):(y - x)$ is equivalent to $k:1$

Show that $y = \frac{x(k + 1)}{k - 1}$

(Total for Question 14 is 3 marks)

15 $x = 0.4\dot{3}\dot{6}$

Prove algebraically that x can be written as $\frac{24}{55}$

(Total for Question 15 is 3 marks)



15 Three solid shapes **A**, **B** and **C** are similar.

The surface area of shape **A** is 4 cm^2

The surface area of shape **B** is 25 cm^2

The ratio of the volume of shape **B** to the volume of shape **C** is $27:64$

Work out the ratio of the height of shape **A** to the height of shape **C**.

Give your answer in its simplest form.

(Total for Question 15 is 4 marks)

16 Prove algebraically that $0.2\dot{5}\dot{6}$ can be written as $\frac{127}{495}$

(Total for Question 16 is 3 marks)



- 15 Express $0.4\dot{1}\dot{8}$ as a fraction.
You must show all your working.

(Total for Question 15 is 3 marks)

- 16 (a) Rationalise the denominator of $\frac{22}{\sqrt{11}}$
Give your answer in its simplest form.

(2)

- (b) Show that $\frac{\sqrt{3}}{2\sqrt{3}-1}$ can be written in the form $\frac{a+\sqrt{3}}{b}$ where a and b are integers.

(3)

(Total for Question 16 is 5 marks)



- 12 Express $0.1\dot{1}\dot{7}$ as a fraction.
You must show all your working.

(Total for Question 12 is 3 marks)



13 A and B are points on a centimetre grid.

A is the point with coordinates $(-7, 6)$

B is the point with coordinates $(8, -5)$

Work out the length of AB .

Give your answer correct to 1 decimal place.

..... cm

(Total for Question 13 is 2 marks)

14 Using algebra, prove that $1.0\dot{6}\dot{2}$ can be written as $1\frac{14}{225}$

(Total for Question 14 is 3 marks)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Work out $8.46 \div 0.15$

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

2 Work out $7\frac{3}{8} - 2\frac{1}{2}$

Give your answer as a mixed number.

.....
(Total for Question 2 is 3 marks)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Work out 6.3×2.4

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



13 Prove algebraically that $0.0\dot{7}2\dot{3}$ can be written as $\frac{241}{3330}$

(Total for Question 13 is 3 marks)

14 y is proportional to x^2
 $y = 3$ when $x = 0.5$

x is inversely proportional to w
 $x = 2$ when $w = 0.2$

Find the value of y when $w = 2$

$y = \dots\dots\dots$

(Total for Question 14 is 5 marks)



18 Show that $0.\dot{1}\dot{5} + 0.2\dot{2}\dot{7}$ can be written in the form $\frac{m}{66}$ where m is an integer.

(Total for Question 18 is 3 marks)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** Work out $818.4 \div 1.2$

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



14 Prove algebraically that $0.4\dot{6}\dot{2}$ can be written as $\frac{229}{495}$

(Total for Question 14 is 3 marks)

15 Make p the subject of the formula $t = \frac{2(2p - 3)}{5 - 2p}$

(Total for Question 15 is 4 marks)



13 $x = 0.\dot{2}$ $y = 0.6\dot{8}\dot{1}$

Work out the value of xy .

Give your answer as a fraction in its simplest form.

.....
(Total for Question 13 is 5 marks)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 (a) Work out 3.67×4.2

.....
(3)

(b) Work out $59.84 \div 1.6$

.....
(3)

(Total for Question 1 is 6 marks)



SUB-TOPIC N2c

PERCENTAGES

Sub-topic N2c · 24 questions · 79 marks · lowest tariff first



8 Len has 8 parcels.

The mean weight of the 8 parcels is 2.5 kg.

The mean weight of 3 of the parcels is 2 kg.

Work out the mean weight of the other 5 parcels.

..... kg

(Total for Question 8 is 3 marks)

9 In a sale, the normal price of a coat is reduced by $R\%$

Given that

$$\text{sale price} = 0.7 \times \text{normal price}$$

find the value of R .

$R =$

(Total for Question 9 is 1 mark)



- 9 Jules buys a washing machine.

20% VAT is added to the price of the washing machine.

Jules then has to pay a total of £600

What is the price of the washing machine with **no** VAT added?

£.....

(Total for Question 9 is 2 marks)

- 10 Show that $(x + 1)(x + 2)(x + 3)$ can be written in the form $ax^3 + bx^2 + cx + d$ where a , b , c and d are positive integers.

(Total for Question 10 is 3 marks)



- 7 The price of a holiday increases by 20%
This 20% increase adds £240 to the price of the holiday.

Work out the price of the holiday before the increase.

£.....

(Total for Question 7 is 2 marks)



- 8 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 8 is 2 marks)

- 9 Some people were asked if they wanted a new television.

70% of the people said yes.

80% of the people who said yes wanted a television with a large screen.

What percentage of the people asked said they wanted a television with a large screen?

..... %

(Total for Question 9 is 2 marks)



- 8 The normal price of a mattress is reduced by 40% in a sale.
The price of the mattress in the sale is £660

Work out the normal price of the mattress.

£.....

(Total for Question 8 is 2 marks)



9 (a) Simplify fully $2x^3y^5 \times 7x^2y$

.....
(2)

(b) Simplify $(m^2)^{-3}$

.....
(1)

(Total for Question 9 is 3 marks)

10 In a sale, the normal prices are reduced by 15%
Amina buys a dress in the sale for £46.75

Work out the normal price of the dress.

£.....

(Total for Question 10 is 2 marks)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Solve $5x - 6 = 3(x - 1)$

$x =$

(Total for Question 1 is 3 marks)

- 2** Emily buys a pack of 12 bottles of water.
The pack costs £5.64

Emily sells all 12 bottles for 50p each.

Work out Emily's percentage profit.

Give your answer correct to 1 decimal place.

.....%

(Total for Question 2 is 3 marks)



11 In 2003, Jerry bought a house.

In 2007, Jerry sold the house to Mia.

He made a profit of 20%

In 2012, Mia sold the house for £162 000

She made a loss of 10%

Work out how much Jerry paid for the house in 2003

£.....

(Total for Question 11 is 3 marks)



11 Jack and Sadia work for a company that sells boxes of breakfast cereal.

The company wants to have a special offer.

Here is Jack's idea for the special offer.

Put 25% more cereal into each box and do **not** change the price.

Here is Sadia's idea.

Reduce the price and do **not** change the amount of cereal in each box.

Sadia wants her idea to give the same value for money as Jack's idea.

By what percentage does she need to reduce the price?

..... %

(Total for Question 11 is 3 marks)



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 (a) Write 7357 correct to 3 significant figures.

.....
(1)

(b) Work out $\frac{\sqrt{17 + 4^2}}{7.3^2}$

Write down all the figures on your calculator display.

.....
(2)

(Total for Question 1 is 3 marks)

- 2 Last year Jo paid £245 for her car insurance.
This year she has to pay £883 for her car insurance.

Work out the percentage increase in the cost of her car insurance.

.....%

(Total for Question 2 is 3 marks)



- 10** Marie invests £8000 in an account for one year.
At the end of the year, interest is added to her account.

Marie pays tax on this interest at a rate of 20%
She pays £28.80 tax.

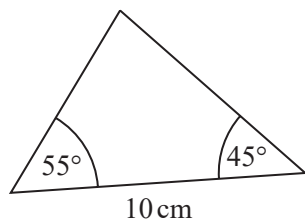
Work out the percentage interest rate for the account.

..... %

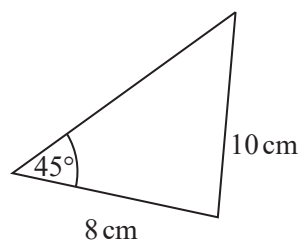
(Total for Question 10 is 3 marks)



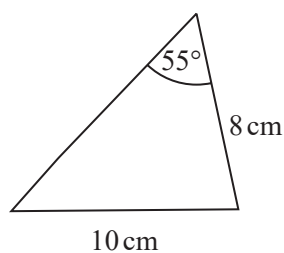
- 4 The diagram shows four triangles.



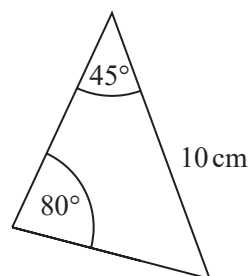
Triangle A



Triangle B



Triangle C



Triangle D

Two of these triangles are congruent.

Write down the letters of these two triangles.

..... and

(Total for Question 4 is 1 mark)

- 5 Sean pays £10 for 24 chocolate bars.

He sells all 24 chocolate bars for 50p each.

Work out Sean's percentage profit.

..... %

(Total for Question 5 is 3 marks)



- 8 Chanda buys a necklace for £120
She sells the necklace for £135

Work out her percentage profit.

.....%

(Total for Question 8 is 3 marks)

- 9 Here are the equations of two straight lines.

$$y = \frac{1}{2}x - 6 \qquad 6y = 3x + 7$$

Oscar says that these lines are parallel.

Is Oscar correct?

You must give a reason for your answer.

.....

.....

.....

(Total for Question 9 is 2 marks)



3 Mia pays £25 for 200 oranges.

Mia puts the oranges into bags.

She puts 5 oranges into each bag.

Mia sells all the bags of oranges for £1 each bag.

Work out Mia's percentage profit.

.....%

(Total for Question 3 is 3 marks)



- 3 Renee buys 5 kg of sweets to sell.
She pays £10 for the sweets.

Renee puts all the sweets into bags.
She puts 250 g of sweets into each bag.
She sells each bag of sweets for 65p.

Renee sells all the bags of sweets.

Work out her percentage profit.

.....%

(Total for Question 3 is 4 marks)



- 4 At the end of 2017
the value of Tamara's house was £220 000
the value of Rahim's house was £160 000

At the end of 2019
the value of Tamara's house had decreased by 20%
the value of Rahim's house had increased by 30%

At the end of 2019, whose house had the greater value?
You must show how you get your answer.

(Total for Question 4 is 4 marks)



- 4 Jo is going to buy 15 rolls of wallpaper.

Here is some information about the cost of rolls of wallpaper from each of two shops.

Chic Decor

3 rolls for £36

Style Papers

Pack of 5 rolls
normal price £70

12% off the normal price

Jo wants to buy the 15 rolls of wallpaper as cheaply as possible.

Should Jo buy the wallpaper from Chic Decor or from Style Papers?

You must show how you get your answer.

(Total for Question 4 is 4 marks)



2 Karen is organising a party for a charity.

She spends

£100 on food

£120 on a hall

£80 on a DJ.

Karen sells 54 tickets for the party.

Each ticket costs £7.50

Work out the percentage profit Karen makes for the charity.

.....%

(Total for Question 2 is 4 marks)



- 6 The cost of a first class stamp increased from 76p to 85p.
The cost of a second class stamp increased from 65p to 66p.

Filip says,

“The percentage increase in the cost of a first class stamp is more than 7 times
the percentage increase in the cost of a second class stamp.”

Is Filip correct?

You must show all your working.

(Total for Question 6 is 4 marks)



12 The price of a holiday is increased by 10%

After the increase, the price of the holiday is £440

Jim says,

“10% of £440 is £44 so the price of the holiday before the increase was £396”

(a) Is Jim correct?

Explain your answer.

(1)

Tina sells bikes.

In November, Tina sold 25% fewer bikes than she sold in October.

In December, Tina sold 50% more bikes than she sold in November.

In December, Tina sold 180 bikes.

(b) How many bikes did Tina sell in October?

(3)

(Total for Question 12 is 4 marks)



- 3 A bonus of £2100 is shared by 10 people who work for a company.
40% of the bonus is shared equally between 3 managers.
The rest of the bonus is shared equally between 7 salesmen.

One of the salesmen says,

“If the bonus is shared equally between all 10 people I will get 25% more money.”

Is the salesman correct?

You must show how you get your answer.

(Total for Question 3 is 5 marks)



8 Tariq buys a laptop.

He gets a discount of 5% off the normal price.

Tariq pays £551 for the laptop.

(a) Work out the normal price of the laptop.

£
(2)

Joan invests £6000 in a savings account.

The savings account pays compound interest at a rate of

2.4% for the first year

1.7% for each extra year.

(b) Work out the value of Joan's investment at the end of 3 years.

£
(3)

(Total for Question 8 is 5 marks)



- 2 Jonny wants to know how much coffee he will need for 800 people at a meeting.

Each person who drinks coffee will drink 2 cups of coffee.

10.6 g of coffee is needed for each cup of coffee.

Jonny assumes 68% of the people will drink coffee.

- (a) Using this assumption, work out the amount of coffee Jonny needs.
Give your answer correct to the nearest gram.

..... g
(4)

Jonny's assumption is wrong.

72% of the people will drink coffee.

- (b) How does this affect your answer to part (a)?

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

(Total for Question 2 is 5 marks)



- 5 Robyn buys a total of 240 pens and pencils, where

$$\text{number of pens} : \text{number of pencils} = 3 : 5$$

Robyn pays 9p for each pen.
She sells each pen for 11p.

Robyn pays 6p for each pencil.
She sells each pencil for 10p.

Robyn sells all of the pens and pencils.

Work out Robyn's percentage profit.
Give your answer correct to 1 decimal place.
You must show all your working.

.....%

(Total for Question 5 is 5 marks)



MARK SCHEMES

official mark schemes, in the same order as the questions



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
8	(a)	75 to 81	B2	for answer in the range 75 to 81
			(B1	for 60 or 100 or 6000 or 6400 or $\sqrt{64 \times 100}$)
	(b)	0.000 148	B1	for 0.000 148 oe
	(c)	$\frac{1}{25}$	B1	for $\frac{1}{25}$ or 0.04
9		$5\frac{3}{5}$	M1	for writing as improper fractions with at least one correct, eg $\frac{7}{2} \times \frac{8}{5}$ oe
			M1	(dep) for multiplying improper fractions, eg " $\frac{56}{10}$ " or $5\frac{6}{10}$ or $\frac{28}{5}$ oe
			A1	cao
10	$x = 2.2$ to 2.3 $y = -1.3$ to -1.4		M1	for recognition of use of intersection point, one of the solutions given, solutions reversed or solutions given as a coordinate.
			A1	x given in the range 2.2 to 2.3, y given in the range -1.3 to -1.4

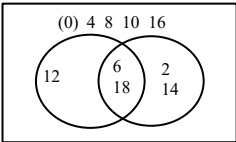


Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
2	2 (supported)	P1	for a process to find the number of men, eg. $(60 \div 2) \div 3 (= 10)$	$60 \div 3 = 20$ scores no marks Any ratio must come from correct processes to find the number of children and the number of men Award 0 marks for 2 with no correct supportive working Award full marks for 2 : 1 given as a final answer from correct supportive working
		P1	for a process to find the number of children, eg. $60 - "30" - "10" (= 20)$	
		P1	for a start of a process to find the value of n , eg. $("20" : "10") \div 5$ or $20 : 10 = 10 : 5$ or $"20" \div "10"$	
		A1	for 2 with supportive working	
3	$2 \frac{1}{3}$	M1	for either $\frac{7}{4}$ oe or $\frac{4}{3}$ oe	
		M1	for method to find the product, eg. $\frac{7 \times 4}{4 \times 3}$ or $\frac{21 \times 16}{12 \times 12}$ oe or for $\frac{28}{12}$ or $\frac{7}{3}$ oe	
		A1	for $2 \frac{1}{3}$ or an equivalent mixed number	
4	perpendicular line constructed	C2	for a fully correct construction with all relevant arcs drawn	Perpendicular line segment between P and CD must be within guidelines Accept dotted lines
		(C1	for a perpendicular line drawn from P to the line CD or all relevant arcs drawn)	



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
1	$3n - 2$	B2 (B1)	for $3n - 2$ oe for $3n + k$ where $k \neq -2$ or is absent unambiguously shown)	Accept a different variable, eg. $3x - 2$ $n = 3n - 2$ gets B1 only $n + 3$ gets NO marks
2	Shown	M1 M1 C1	for conversion to improper fractions eg. $\frac{7}{3}$ or $\frac{15}{4}$ (dep) for method to multiply fractions, eg. $\frac{7 \times 15}{3 \times 4} (= \frac{105}{12})$ or $\frac{28 \times 45}{12 \times 12} (= \frac{1260}{144})$ oe for complete working showing each stage as far as $\frac{35}{4}$ or $8\frac{9}{12}$	Need not be shown with operators
3	B C D A	B2 (B1)	cao for two or three correct)	
4	A & D	B1	cao	



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
2	Venn Diagram	C1 C1 C1	for one correct region for two correct regions for all regions correct	(0) 4 8 10 16  Ignore all entries except the region you are marking for each mark
3	$1\frac{8}{15}$	M2 (M1) A1	for a complete method, eg $4 - 2 + \frac{3}{15} - \frac{10}{15}$ condoning error with one numerator or for $\frac{21}{5} - \frac{8}{3} = \frac{63}{15} - \frac{40}{15} (= \frac{23}{15})$ with no more than one error for finding two fractions with a correct common denominator, with at least one correct corresponding numerator, eg $\frac{3}{15}, \frac{10}{15}$ or for converting both to improper fractions, eg $\frac{21}{5}, \frac{8}{3}$ $1\frac{8}{15}$ oe	At least one improper fraction must be correct Any equivalents must be a mixed number

Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
1	56.4	M1 A1 A1	for a start to a method, eg $846 \div 15$ or $8.46 \div 0.15$ or $8.46 \div 3 \times 20$ or $282 \div 5$ that leads to 5 as the first digit or for a complete method with no more than one arithmetic error for digits 564 identified (ft) dep on M1 for correct placement of the decimal point into their final answer	A start to a repeated subtraction method or a build-up method is acceptable if a correct first digit of 5 is found An answer of $56\frac{2}{5}$ gets 3 marks
2	$4\frac{7}{8}$	M2 (M1 A1	for a complete method, eg $7 - 2 + \frac{3}{8} - \frac{4}{8}$ condoning error with one numerator or for $\frac{59}{8} - \frac{5}{2} = \frac{59}{8} - \frac{20}{8} (= \frac{39}{8})$ with no more than one error OR for an answer of 4.875 (M1 for finding two fractions with a correct common denominator, with at least one correct corresponding numerator, eg $\frac{3}{8}, \frac{4}{8}$ or for converting both to improper fractions, eg $\frac{59}{8}, \frac{5}{2}$ OR for $7.375 - 2.5$) A1 for $4\frac{7}{8}$ oe eg $4\frac{14}{16}$	At least one improper fraction must be correct Both decimals must be correct Any equivalents must be a mixed number



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
2 (a)	$2\frac{2}{15}$	M1	for a method to subtract using a common denominator with at least one fraction correct (suitable common denominator for original fractions with at least one correct numerator) eg $\frac{57}{15} - \frac{25}{15}$ or $(3)\frac{12}{15} - (1)\frac{10}{15}$	Use of decimals gets no credit unless it leads to a correct fraction
		A1	for $2\frac{2}{15}$ oe eg $\frac{32}{15}$	ISW incorrect conversion from improper fraction to mixed number or incorrect simplification of improper fraction
		C1	for explaining that Kevin did not convert to the correct mixed number Acceptable examples In his answer $\frac{9}{24}$ should have been $\frac{11}{24}$ The 9 should be 11 He has not got the numerator right in his final answer He simplified into the mixed number incorrectly He has not put the remainder as the numerator $1\frac{9}{24}$ would give you $\frac{33}{24}$ rather than $\frac{35}{24}$ $\frac{35}{24} = 1\frac{11}{24}$ Not acceptable examples He should have used a common denominator He has not simplified his answer He should have done keep, flip, change He converted the fraction wrongly The answer should be $1\frac{10}{24}$	Figures may be seen in the question space
(b)	Mistake identified			



Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
5	10 000	M1	for recognising 8000 is $\frac{4}{5}$ eg $8000 \div 4 (= 2000)$ or $\frac{4}{5} = 8000$ or $8000 = 80\%$ or $8000 \div 80 (= 100)$ or $x \times 0.8 = 8000$	
		M1	for a complete method, eg “2000” $\times 5$ or $8000 \times \frac{5}{4}$ or “100” $\times 100$ or $\frac{8000}{0.8}$	
		A1	cao	



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
1 (a)	$\frac{95}{28}$	M1	for a method to add using common denominators with at least one fraction correct (matching numerator with common denominator) eg $\frac{60}{28} + \frac{35}{28}$ or $(2)\frac{4}{28} + (1)\frac{7}{28}$	Use of decimals gets no credit unless it leads to a correct fraction
		A1	$\frac{95}{28}$ oe eg $3\frac{11}{28}$	
	$1\frac{3}{5}$	M1	for $\frac{6}{5} \times \frac{4}{3}$ or $\frac{24}{20} \div \frac{15}{20}$ or $\frac{8}{5}$ oe eg $1\frac{9}{15}$	Use of decimals gets no credit unless it leads to a correct fraction
		A1	cao	
2	140	P1	for beginning to solve the problem eg $50 \div 5 \times 8 (=80)$ or $14 : 8 : 5$ oe or $14 : 8$ and $8 : 5$ oe (linked)	80 may be seen in the ratio $80 : 50$
		P1	for a full process to solve the problem eg " 80 " $\div 4 \times 7$ or $\frac{50}{5} \times "14"$ or $140 : 80 : 50$	
		A1	cao	
				If 140 clearly identified as houses in working award full marks



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
1	$2^2 \times 5^3$	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
2 (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 an answer of 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 $\frac{72}{12}$	



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
10 (a)	10	M1	for $25^{\frac{1}{2}} = 5$ or $8^{\frac{1}{3}} = 2$	Accept $25^{\frac{1}{2}} = -5$ for M1 only
		A1	cao	
(b)	$\frac{1}{8}$	M1	for $\left(\frac{1}{\sqrt[5]{32}}\right)^3$ or $\left(\frac{1}{2}\right)^3$ or $\sqrt[5]{\frac{1}{32^3}}$ or $\sqrt[5]{\frac{1}{32768}}$	
		A1	for $\frac{1}{8}$ oe	
			SCB1 for answer of 8 if M0 scored	

Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
3 (a)	$2\frac{1}{3}$	M1	for a method to subtract by writing both fractions with a common denominator with at least one correct numerator, eg $3\frac{3}{6}-1\frac{1}{6}$ or $\frac{3}{6}-\frac{1}{6}(=\frac{2}{6})$ or $\frac{21}{6}-\frac{7}{6}(=\frac{14}{6})$ or $\frac{42}{12}-\frac{14}{12}(=\frac{28}{12})$	Do not isw incorrect further work from correct equivalent mixed number
		A1	for $2\frac{1}{3}$ or an equivalent mixed number	
	Shown	M1	for conversion to improper fractions, eg $\frac{21}{4}$ or $\frac{7}{3}$ or $\frac{9}{4}$	
		M1	(dep) for method to divide by a fraction, eg $\frac{21}{4}\times\frac{3}{7}$ or $\frac{63}{12}\div\frac{28}{12}$	
		C1	for complete work showing each stage as far as $\frac{9}{4}$ or $2\frac{7}{28}$	
(b)				Must see an intermediate step, eg $\frac{63}{28}$ must be seen and then cancelled or correct cancelling seen before the multiplication



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
13	Explanation	C1	explanation Acceptable examples he should have used $100(x)$ rather than $10(x)$ he should have used $1000x$ and $10x$ Ted's working does not eliminate the recurring decimals the recurring numbers after the decimal point have to be in the same sequence he should have multiplied by 100 to subtract easier after the decimal point he should have multiplied by 100 because two numbers are recurring Not acceptable examples it is not correct the method is not complete he should have used $1000x$ he should have multiplied by 100 he should have multiplied by 100 and then done $100x - 10x$ to give $43/90$	
14	Shown	M1 M1 A1	for a start to the method, eg finds one correct area $4(x+1)$ or $(x+7)(2x+6)$ or $(x+1)(x+11)$ or $(x+7)(x+5)$ or $4(x+5)$ or $(x+11)(2x+6)$ for a complete expression for the total area, eg $4(x+1) + (x+7)(2x+6)$ or $4x + 4 + 2x^2 + 14x + 6x + 42$ OR $(x+1)(x+11) + (x+7)(x+5)$ or $x^2 + x + 11x + 11 + x^2 + 7x + 5x + 35$ OR $(x+11)(2x+6) - 4(x+5)$ or $2x^2 + 22x + 6x + 66 - 4x - 20$ for a complete chain of reasoning with fully correct algebra leading to $2x^2 + 24x + 46$	$2x^2 + 24x + 46$ is given so need to see brackets expanded correctly



Paper: 1MA1/1H				
Question	Working	Answer	Mark	Notes
7		Comment	B1	for correct mathematical comment eg line segments not a curve or should draw freehand or should not use a ruler, or should be a curve NB Do not accept statements about scale or plotting accuracy.
8		0.246, 0. $\dot{2}46$ 0. $\dot{2}4\dot{6}$, 0.24 $\dot{6}$	M1 A1	for correct use of recurring symbol eg $0.2\dot{4}6 = 0.24646\dots$ or 3 terms in the correct relative position cao
9		22.5	P1 P1 P1 P1 A1	for process to find James' speed eg $50 \div 2.5 (=20)$ or $50 \div 150 (= \frac{1}{3})$ for process to find James' time for 15 km eg $15 \div "20" (=0.75)$ or $15 \div \frac{1}{3} (=45)$ for process to find Peter's time for 15 km eg $"45" - 5 (=40)$ for process to find Peter's speed eg $15 \div "40"$ or $15 \div \frac{"40"}{60}$ oe
10 (a)		10	B1	accept ± 10
(b)		25	M1 A1	for $(\sqrt[3]{125})^2$ or $\sqrt[3]{125} = 5$ or $125^2 = 15625$ or $\sqrt[3]{125^2}$ cao





Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
3	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.	
4	0.00128	M1 A1	for digits 128 or for correct placement of the decimal point following one arithmetical error, eg $32 \times 4 = 138$ with an answer of 0.00138 for 0.00128 or 1.28×10^{-3}	
5	7500	M1 A1	for method to find expected number of model B, eg $\frac{15}{80} \times 40000$ oe or $\frac{15}{23+15+30+12} \times 40000$ oe cao	



Paper: 1MA1/2H				
Question	Working	Answer	Mark	Notes
15		Proof	C1 C1 C1	for identifying one pair of equal angles with a correct reason, e.g. (angle) $BAE =$ (angle) CDE; <u>angles</u> in the same <u>segment</u> are equal or <u>angles</u> at the circumference <u>subtended</u> on the same <u>arc</u> are equal or for identifying two pairs of equal angles with no correct reasons given (angles must be within the appropriate triangles) for identifying a second pair of equal angles with a correct reason, e.g. (angle) $AEB =$ (angle) DEC; <u>opposite angles</u> or <u>vertically opposite angles</u> are equal or for identifying the three pairs of equal angles with no correct reasons given for stating the three pairs of equal angles of the two triangles e.g. $ABE = DCE$, $BEA = CED$, $EAB = EDC$ with fully correct reasons
16			M1 M1 C1 OR M1 M1 C1	for the start of a method to convert 0.22... to a fraction, eg $10y = 2.22\ldots$ or $(y =) \frac{2}{9}$ for the start of a method to convert 0.13636... to a fraction, $10x = 1.3636\ldots$ or $100x = 13.6363\ldots$ or $1000x = 136.3636\ldots$ or $(x =) \frac{13.5}{99}$ or $(x =) \frac{135}{990}$ for correct arithmetic and concluding the proof OR for $0.13\bar{6} \times 0.2 = 0.0\bar{3} (= z)$ for complete method to find two appropriate recurring decimals the difference of which is a rational number, eg. $100z = 3.0303\ldots (z =) 0.0303\ldots$ or $\frac{3}{99}$ for correct arithmetic and concluding the proof

Paper: 1MA1/1H				
Question	Working	Answer	Mark	Notes
14	$ky - y = x + kx$ $y(k-1) = x(1+k)$	$y = \frac{x(k+1)}{k-1}$	M1 M1 A1	$y + x = k(y - x)$ or $\frac{y+x}{y-x} = k$ oe For isolating x and y on opposite sides eg $ky - y = x + kx$ Completing correct algebraic reasoning to reach conclusion
15		Proof to reach $\frac{24}{55}$	M1 M1 A1	for $100x = 43.636\ldots (43.\dot{6}\dot{3})$ or $10x = 4.3636\ldots (4.\dot{3}\dot{6})$ and $1000x = 436.36\ldots (436.\dot{3}\dot{6})$ (dep) for finding difference that would lead to a terminating decimal for completing algebra to reach $\frac{24}{55}$
16		$\frac{7}{3}$	M1 M1 A1	for $y = k\sqrt[3]{x}$ oe or $\frac{7}{6} = \sqrt[3]{8}k$ oe for $k = \frac{7}{6 \times \sqrt[3]{8}}$ oe for $\frac{7}{3}$ oe
17		Completes proof	M1 C1	Expands both expressions eg $\frac{1}{2}(n^2 + n + n^2 + n + 2n + 2)$ or $n^2 + n$ and $n^2 + n + 2n + 2$ or factorises $\frac{1}{2}(n+1)(n+n+2)$ Completes proof with explanation and reference to $(n+1)^2$



Paper: IMA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
16	Proof with $\frac{127}{495}$	M1 M1 C1	0.25656... or $0.2 + 0.05656...$ or $(10 \times 0.25\dot{6} =) 2.\dot{5}6$ or $2.5656...$ or $(100 \times 0.25\dot{6} =) 25.\dot{6}5$ or $25.6565...$ or $(1000 \times 0.25\dot{6} =) 256.\dot{5}6$ or $256.5656...$ for finding two correct recurring decimals that when subtracted would result in a terminating decimal or integer, eg. $256.5656..... - 2.5656.....$ or $25.6565..... - 0.25656.....$ or $256.\dot{5}6 - 2.\dot{5}6$ or $25.\dot{6}5 - 0.25\dot{6}$ or for $\frac{254}{990}$ or $\frac{25.4}{99}$ full proof seen with $\frac{127}{495}$	
17	(2, -9)	P1 P1 P1 A1	substitutes $x = 0, y = -5$ into $y = x^2 + ax + b$ ($b = -5$) or substitutes $x = 5, y = 0$ into $y = x^2 + ax + b$ ($0 = 25 + 5a + b$) or starts process to find other intercept, eg writes $y = (x - 5)(x - k)$ for complete process to find two intercepts, eg. substitutes the second point into $y = x^2 + ax + b$ and solves to find a ($= -4$) and b ($= -5$) or substitutes $x = 0, y = -5$ into $y = (x - 5)(x - k)$ and solves to find k ($= -1$) (dep on P2) for factorising or completing the square of $x^2 + "-4"x + "-5"$ and identifying the x-coordinate of the turning point or for a complete process to find the x-coordinate of the turning point, eg $(5 + "-1")/2$ cao	x-coordinate of 2 with no or incorrect working gets NO marks

Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
15	$\frac{414}{990}$	M1 M1 A1	for $(x =) 0.41818\dots$ or $(10x =) 4.\dot{1}8$ or $4.1818\dots$ or $(100x =) 41.\dot{8}1$ or $41.818\dots$ or $(1000x =) 418.\dot{1}8$ or $418.18\dots$ for using two recurring decimals with a terminating decimal difference, eg. $(1000x - 10x =) 418.\dot{1}8 - 4.\dot{1}8$ or $418.18\dots - 4.1818\dots (= 414)$ for $\frac{414}{990}$ oe, eg $\frac{23}{55}$	Accept $(100x - x =) 41.\dot{8}1 - 0.4\dot{1}8$ or $41.818\dots - 0.41818\dots (= 41.4)$ $\frac{41.4}{99}$ must be simplified to gain the accuracy mark
16 (a)	$2\sqrt{11}$	M1 A1	for method to multiply numerator and denominator by $\sqrt{11}$ or a multiple of $\sqrt{11}$, eg $\frac{22}{\sqrt{11}} \times \frac{\sqrt{11}}{\sqrt{11}}$ for $2\sqrt{11}$	
(b)	$\frac{6 + \sqrt{3}}{11}$	M1 M1 A1	for method to multiply numerator and denominator by $2\sqrt{3} + 1$ or a multiple of $2\sqrt{3} + 1$, eg $\frac{\sqrt{3}}{2\sqrt{3} - 1} \times \frac{2\sqrt{3} + 1}{2\sqrt{3} + 1}$ (dep) for $\sqrt{3} \times 2\sqrt{3} = 6$ or $2\sqrt{3} \times 2\sqrt{3} = 12$ for $\frac{6 + \sqrt{3}}{11}$ (accept $a = 6$ and $b = 11$)	

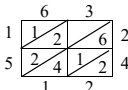


Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
12	$\frac{116}{990}$	M1	for $(x =) 0.11717\ldots$ or $(10x =) 1.\dot{1}7$ or $1.1717\ldots$ or $(100x =) 11.\dot{7}1$ or $11.7171\ldots$ or $(1000x =) 117.\dot{1}7$ or $117.1717\ldots$	
		M1	(dep M1) for a method using two recurring decimals that leads to a terminating decimal difference, using correct multiples of x eg $(1000x - 10x =) 117.\dot{1}7 - 1.\dot{1}7 (= 116)$ or $117.1717\ldots - 1.1717\ldots (= 116)$	Accept $(100x - x =) 11.\dot{7}1 - 0.\dot{1}7$ or $11.7171\ldots - 0.11717\ldots (= 11.6)$
		A1	for $\frac{116}{990}$ oe, eg $\frac{58}{495}$	$\frac{11.6}{99}$ must be written in the form $\frac{a}{b}$ where a and b are integers to gain the accuracy mark



Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
13	18.6	M1 A1	for use of Pythagoras eg, $(-5 - 6)^2 + (8 - -7)^2$ or $121 + 225$ or 346 or $\sqrt{346}$ answer in the range 18.6 to 18.61	If a correct answer within the range is shown in working but incorrectly rounded award full marks
14	Shown	M1 M1 A1	for $(x =) 1.0622\ldots$ or $(10x =) 10.622\ldots$ or $(100x =) 106.22\ldots$ or $(1000x =) 1062.2\ldots$ OR for $(x =) 0.0622\ldots$ or $(10x =) 0.622\ldots$ or $(100x =) 6.22\ldots$ or $(1000x =) 62.2\ldots$ (dep M1) for a method using two recurring decimals that leads to a terminating decimal difference, using correct multiples of x eg $(1000x - 100x =) 1062.2\ldots - 106.22\ldots (= 956)$ or $\frac{956}{900}$ OR (dep M1) for a method using two recurring decimals that leads to a terminating decimal difference, using correct multiples of x eg $(1000x - 100x =) 62.2\ldots - 6.22\ldots (= 56)$ or $\frac{56}{900}$ for completing algebra to $1\frac{14}{225}$	Use of recurring notation acceptable throughout.



Paper: 1MA1/1H													
Question	Answer	Mark	Mark scheme	Additional guidance									
1	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><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										
2	(a)(i)	1	B1	cao									
	(ii)	$\frac{1}{25}$	B1	oe									
	(b)	2^6	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: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
13	Proof	M1	for eg, $(10x =) 0.723723\dots$ or $(100x =) 7.237237\dots$ or $(1000x =) 72.372372\dots$ or $(10000x =) 723.723723\dots$	Any recurring notation acceptable throughout. Proofs with terminating decimals (less than 6 figures) score M1M1A0
		M1	(dep M1) for a method using two recurring decimals that leads to a terminating decimal difference, using correct multiples of x eg $(10000x - 10x =) 723.723723\dots - 0.723723\dots$	
		A1	for completing the algebra to $\frac{241}{3330}$ oe	
14	0.48	P1	for setting up an equation with a constant term, eg $y = kx^2$ or $x = \frac{j}{w}$	Condone the use of " ∞ " instead of " ∞ " for the first two P marks Equation can be implied by correct substitution $y = \frac{1.92}{w^2}$
		P1	for a process to substitute values in one equation, eg $3 = k \times 0.5^2$ or $k = 12$ or $2 = j \div 0.2$ or $j = 0.4$	
		P1	(dep P2) for combining the two equations ft their values of k and j eg $y = "12" \times \left(\frac{"0.4"}{w}\right)^2$ oe OR for correct process to find the value of x when $w = 2$, eg $x = "0.4" \div 2 (= 0.2)$	
		P1	for substitution into their formula, eg $y = \frac{"1.92"}{2^2}$ OR for using found value of x to find the value of y , eg $y = "12" \times "0.2"^{0.2}$	
		A1	oe	



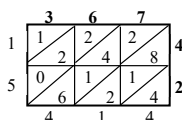
Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
18	Shown	M1	for $0.1515... + 0.22727... (= 0.37878... \text{ or } 0.3\overline{78})$	Recurring decimal notation acceptable for this mark
		M1	for finding two correct recurring decimals that when subtracted would result in a terminating decimal or integer, eg $(1000x - 10x =) 378.7878... - 3.7878... (= 375)$ or $\frac{375}{990}$ or $(100x - x =) 37.8787... - 0.37878... (= 37.5)$ or $\frac{37.5}{99}$	
		C1	for correct working leading to $\frac{25}{66}$ OR	
		M1	for start of a method to convert $0.1515... \text{ or } 0.22727...$ to a fraction, eg $100x = 15.1515... \text{ or } \frac{15}{99} \text{ or } \frac{5}{33}$ oe or $10y = 2.2727... \text{ or } 100y = 22.7272... \text{ or } 1000y = 227.2727...$ or $\frac{225}{990} \text{ or } \frac{22.5}{99} \text{ or } \frac{5}{22}$ oe	Recurring decimal notation acceptable for both M marks
		M1	for a method to convert $0.1515... \text{ and } 0.22727...$ to fractions, eg $(100x - x =) 15.1515... - 0.1515... (= 15)$ or $\frac{15}{99} \text{ or } \frac{5}{33}$ oe and $(1000y - 10y =) 227.2727... - 2.2727... (= 225)$ or $(100y - y =) 22.7272... - 0.22727... (= 22.5)$ or $\frac{225}{990} \text{ or } \frac{22.5}{99} \text{ or } \frac{5}{22}$ oe	
		C1	for correct working leading to $\frac{25}{66}$	

Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
1	682	M1	for a start to a method, eg $8184 \div 12$ (or $818.4 \div 1.2$) that leads to 6 as the first digit or for a complete method with no more than one arithmetic error	A start to a repeated subtraction method or build-up method is acceptable if a correct first digit of 6 is found
		A1	for digits 682	
		A1	ft (dep M1) for correct placement of the decimal point into their final answer	

[illegible]

Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
13	$\frac{5}{33}$	M1	for $10x = 2.\dot{2}$ or $2.22\dots$ or $(10x - x =) 2.\dot{2} - 0.\dot{2} (= 2)$ or $2.22\dots - 0.22\dots (= 2)$ or $\frac{2}{9}$ oe fraction	eg $\frac{20}{90}$, $\frac{22}{99}$
		M1	for a method using two recurring decimals that leads to a terminating decimal difference, using correct multiples of y eg $(1000y - 10y =) 681.\dot{8}\dot{1} - 6.\dot{8}\dot{1} (= 675)$ or $681.81\dots - 6.81\dots (= 675)$ or $\frac{675}{990}$ or $(100y - y =) 68.\dot{1}\dot{8} - 0.6\dot{8}\dot{1} (= 67.5)$ or $68.181\dots - 0.681\dots (= 67.5)$ or $\frac{67.5}{99}$	
		A1	for $(x =) \frac{2}{9}$ oe and $(y =) \frac{675}{990}$ oe	Accept $(y =) \frac{67.5}{99}$
		M1	for “ $\frac{2}{9}$ ” × “ $\frac{675}{990}$ ”	Award 4 marks for an answer equivalent to $\frac{5}{33}$, eg $\frac{15}{99}$, $\frac{135}{891}$, $\frac{1350}{8910}$ unless from incorrect working
		A1	cao	



Paper: 1MA1/1H																
Question	Answer	Mark	Mark scheme	Additional guidance												
1 (a)	15.414	M1	for a complete method with relative place value correct including intention to add all the appropriate elements of the calculation eg 2 lines of the 1 st method, internal numbers of grids, or complete structure shown of partitioning methods.	14680 734 15414  <table border="1" data-bbox="1064 1048 1324 1111"><tr><td></td><td>300</td><td>60</td><td>7</td></tr><tr><td>40</td><td>12000</td><td>2400</td><td>280</td></tr><tr><td>2</td><td>600</td><td>120</td><td>14</td></tr></table> $12000 + 2400 + 280 + 600 + 120 + 14 = 15414$		300	60	7	40	12000	2400	280	2	600	120	14
			300	60	7											
		40	12000	2400	280											
		2	600	120	14											
		A1	for digits 15414													
A1	(ft) dep on M1 for correct placement of the decimal point into their final answer															
(b)	37.4	M1	for a start to a method, eg $598.4 \div 16$ (or $59.84 \div 1.6$) = 3 (as a first digit)	A start to a repeated subtraction method or build-up method is acceptable if a correct first digit of 3 is found												
		A1	for digits 374													
		A1	(ft) dep on M1 for correct placement of the decimal point into their final answer													

Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
8	2.8	M1	for $8 \times 2.5 (= 20)$ or $3 \times 2 (= 6)$	
		M1	for a complete method eg $(^{-}20 - ^{-}6) \div 5$	
		A1	for 2.8 or $2\frac{4}{5}$ oe mixed number	
9	30	B1	cao	
10	$x = 3$ $y = -4$	M1	for a correct method to eliminate either variable or rearrangement of one equation leading to substitution (condone one arithmetic error)	
		A1	for either $x = 3$ or $y = -4$	
		M1	(dep M1) for a correct substitution of found value into one of the equations or a correct method leading to the second value (condone one arithmetic error)	
		A1	for $x = 3$ and $y = -4$ NB Trial and improvement methods score 0 marks unless both x and y are correct	

Paper: 1MA1/1H				
Question	Working	Answer	Mark	Notes
5		70.5	P1 P1 P1 P1 A1	starts process of Pythagoras e.g. $5^2 + 12^2$ complete process for Pythagoras e.g. $\sqrt{5^2 + 12^2}$ or $\sqrt{25 + 144}$ or $\sqrt{169}$ (=13) (dep P1 for Pythagoras) process of adding all the lengths e.g. $5 + 5 + 12 + 12 + "13"$ (=47) (indep) process of multiplying at least 2 lengths by 1.5 cao SC: any evidence of working with Pythagoras award the P1 or P2
6		comparison	M1 A1	starts to manipulate expression e.g. $3y = 9x - 6$ or $3y = 9x - 5$ gives equation(s) which can be used to show that the gradients of the two lines are the same e.g. $y = 3x - 5/3$
7		72	P1 P1 A1	for showing the process of 30×60 (=1800) or 20×54 (=1080) (dep P1) for showing the complete process e.g. (" 1800 " – " 1080 ") $\div 10$ concluding the answer is 72 (and not 66)
8 (a) (b)		0.00000797 6.3×10^7	B1 M1 A1	cao for partial calculation involving powers of 10 e.g. $0.63 \times 10^{5-3}$ or 6.3×10^n where $n \neq 7$ or for $n \times 10^8$ or for 63000000 cao
9		500	M1 A1	recognition of 1.2 or 120% oe eg $600 \div 1.2$ oe $x \times 1.2 = 600$ oe or $120\% = 600$ cao
10		$x^3 + 6x^2 + 11x + 6$	M1 M1 A1	for method to find the product of any two linear expressions (3 correct terms) e.g. $x^2 + x + 2x + 2$ or $x^2 + 2x + 3x + 6$ or $x^2 + x + 3x + 3$ for method of multiplying out remaining products, half of which are correct (ft their first product) e.g. $x^3 + x^2 + 2x^2 + 3x^2 + 2x + 3x + 6x + 6$ cao



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
6	(a) Description	C1	for a valid description of the relationship Acceptable examples As age increases, weight increases The older you are the greater the weight Positive correlation Not acceptable examples Positive (relationship) age and weight are in proportion strong correlation or correlation is increasing as the babies get older the heavier they get, negative correlation they are directly proportional, weight goes up as age goes up	Accept positive correlation Ignore any comment about strength
	(b) 2.5 to 4.5	B2 (B1	for an answer in the range 2.5 to 4.5 for a suitable line of best fit drawn or for a point on the grid at (x, 5.8) where x lies between 2.5 and 4.5 or a horizontal line drawn from 5.8 across to (x, 5.8) where x is in the range 2.5 to 4.5)	
7	1200	M1	for a fully correct method, eg $240 \div 0.2$ or 240×5 oe	
		A1	cao SC B1 for an answer of 960 or 1440 if M0 scored	
8	3	P1	for process to find area of base, eg $1200 \div 40 (= 30)$	
		P1	for process to find pressure, eg $90 \div "30"$	
		A1	cao	



Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
9	56	P1 A1	for $70 \times 80 \div 100$ oe or for the use of $0.7 \times 0.8 (= 0.56)$ oe cao	
10	3.1	P1 P1 A1	for using sin to find length of AC, eg $6.8 \times \sin 41$ or a full process to find AC or $(AC =) 4.46...$ or a full process to find AD or $(AD =) 5.44...$ for a complete process to find a relationship involving DC eg $\tan 55 = \frac{4.46...}{DC}$ or $(DC =) \frac{4.46...}{\tan 55}$ or $\cos 55 = \frac{DC}{5.44...}$	Accept rounded or truncated figures. If a correct answer within the range is shown in working but is incorrectly rounded, award full marks.
11 (a)	Box plot	B3 (B2 (B1	for fully correct box plot for box plot showing a box and whiskers and at least 3 correctly plotted values from 169, 174, 177, 180, 186) for at least 2 correctly plotted values including a box or whiskers)	Box can be of any height. Accept ends that are marked (eg line, cross, dot) or defined by the end of the whiskers if clear
(b)	Comparisons	C1 C1	(ft) for a correct comparison of medians, eg the median for Adults is greater than the median for Teenagers or the Teenagers heights are lower in general as the median is lower (ft) for a correct comparison of a measure of spread, eg the interquartile (range) of the Adults is the same as (similar to) the IQR of the Teenagers, the range of the Teenagers is greater than the range of the Adults Comparisons for this mark can relate to the range or the IQR.	For 2 marks, at least one comparison must be in context (eg refers to heights or cm). Simply quoting values for median and range and IQR is insufficient, they must be compared Median Range IQR Adults 177 17 6 Teenagers 169 20.5 6 Figures need not be seen but if given they must be correct.



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
6	144	P1	for using the ratio, eg $x = 2y$ or $2y + 2y + y = 180$ or $2 + 2 + 1 = 5$ (parts))	The first two marks may be awarded in either order Award P2 for $x = 72$ or $y = 36$
		P1	for using angle facts to give an equation, eg $x + x + y = 180$ or $2y + 2y + y = 180$ or $y + w = 180$ or $5x \div 2 = 180$ oe or $w = 2x$ or for $180 \div 5 (= 36)$	
		P1	for a complete process, eg $180 - (180 \div 5)$	
		A1	cao	
7	2400	P1	for setting up an equation in x , eg $x + (3x + 1) + (2x - 5) = 44$ or $6x - 4 = 44$ or $x = 48 \div 6 (= 8)$	
		P1	for substituting “8” into either $(3x + 1)$ or $(2x - 5)$ eg $3 \times “8” + 1 (= 25)$ or $2 \times “8” - 5 (= 11)$	
		P1	for finding the mass of one book, eg $7500 \div “25” (= 300)$	
		P1	for finding the mass of the books on shelf A, eg “300” $\times$ “8”	
		A1	cao	
8	1100	M1	for a complete method to find the original cost, eg $660 \div (100 - 40) \times 100$ or $660 \div 0.6$ oe	
		A1	cao	



Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
10	55	M1	for a complete method eg $46.75 \div 0.85$ oe or for a correct equation eg $0.85x = 46.75$ oe or 55 seen, then used as part of an extended method eg 8.75 or 101.75	
		A1	accept trailing zeros eg 55.00	
11	304	P1	for start of process to find the arc length eg $34.3 - 2 \times 4.7 (= 24.9)$ or for forming a suitable equation eg $\frac{\angle AOB}{360} \times \pi \times 2 \times 4.7 + 2 \times 4.7 = 34.3$	Condone omission of the addition of 2 radii in the equation for this mark only eg $\frac{\angle AOB}{360} \times \pi \times 2 \times 4.7 = 34.3$
		P1	for process to isolate the arc length in an equation eg $\frac{\angle AOB}{360} \times \pi \times 2 \times 4.7 = "24.9"$ or for complete process to find AOB eg $\angle AOB = \frac{"24.9" \times 360}{\pi \times 2 \times 4.7}$	
		A1	answer in the range 303 to 304	If an answer is given in the range in working and then rounded incorrectly award full marks



Paper: 1MA1/2H				
Question	Working	Answer	Mark	Notes
1		$1\frac{1}{2}$	M1	for correct expansion of the bracket or dividing all terms by 3 as a first step eg $3x - 3$ or $(5x - 6)/3 = 3(x - 1)/3$
			M1	for isolating terms in x on one side of an equation eg $5x - 6 - 3x = -3$ or both constants on one side of an equation, eg $5x = 3x - 3 + 6$, ft $5x - 6 = 3x - 1$
			A1	for $1\frac{1}{2}$ oe
2	£6 – £5.64 = 36p or 50p – 47p = 3p 6.3829787...%	6.4	P1	for a strategy to compare the same number of bottles e.g. $£5.64 \div 12$ (= 47 or 0.47) or $12 \times 50p$ (= 6 or 600) or 36 or 0.36 or 3 or 0.03
			P1	for start of process to find percentage profit e.g. $\frac{36}{564}$ or $\frac{3}{47}$ or $\frac{6}{5.64}$ or $\frac{50}{47}$ oe with consistent units
			A1	for answer in the range 6.3 to 6.4



Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
11	150 000	P1 P1 A1	for process to find cost in 2007, eg $162\,000 \div 0.9 (= 180\,000)$ oe for process to find cost in 2003, eg $[\text{cost in 2007}] \div 1.2 (= 150\,000)$ oe cao	Award 2 marks for $162\,000 \div 1.08$ oe
12 (a)	1.5	M1 A1	for method to find the gradient of the line, eg $\frac{12}{8}$ for 1.5 oe	Must see use of scales.
(b)	Explanation	C1	Explanation relating to rate of change of volume with time, eg rate at which the container fills or change in number of litres per second or number of litres added per second	Ignore any quantities given. Award the mark for an explanation involving rate.
(c)	Explanation	C1	Explanation relating to volume (amount) of liquid in the container at the start eg number of litres in the container when $t = 0$, amount of liquid in the container to start with	
13	6.50	M1 M1 A1	for method to find ratio or scale factor of lengths or volumes eg $\sqrt{3} : 2$ or $1 : 1.15(47\dots)$ or $0.86(60\dots) : 1$ or $\sqrt{27} : 8$ oe for complete method to find ratio of volumes and use to find required volume eg $10 \div ("1.15\dots")^3$ or $10 \times ("0.86\dots")^3$ for answer in the range 6.49 to 6.53	Scale factors may just be seen as 1.15..., 0.86...etc If an answer is given within the range then incorrectly rounded to 3 sig figs, award full marks. Accept 6.5



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
11	20	P1 P1 A1	for start of process, eg $\frac{125}{100}$ oe or $\frac{100}{125}$ oe or $\frac{25}{125}$ for a suitable process to develop a percentage, either 80% or 20% eg. $\frac{100}{125} = \frac{x}{100}$ or $\frac{125-100}{125} = \frac{x}{100}$ or $\frac{p}{1.25m} = \frac{xp}{m}$ or $\frac{0.25p}{1.25m} = \frac{xp}{m}$ cao	Values of amount of cereal and cost may be used, eg. 100g of cereal costing £10 An acceptable start of a process would then be: 125g of cereal costing £10 using Jack's idea
12	21	C1 C1 C1	for angle $OAB = 90 - 56 (= 34)$ for process to find angle $CAD (= 69)$ or angle $BCA (= 56)$ or angle $COA (= 138)$, eg use of alternate segment theorem or angle at centre is twice the angle at the circumference cao	Throughout, angles may be written on the diagram; accept as evidence if correct. Ignore absence of degree sign Reasons need not be given.
13	enlargement scale factor $-\frac{1}{3}$ centre (2, 2)	C2 (C1)	for all of: enlargement, (scale factor $= -\frac{1}{3}$ oe, (centre $=$) (2, 2) for two of: enlargement, (scale factor $= -\frac{1}{3}$ oe, (centre $=$) (2, 2)) Note: award no marks if more than one transformation is given	



Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
1	(a) 7360	B1	cao	Answer must be given to at least 4 decimal places rounded or truncated Accept a clear indication of the decimal point. Check first four decimal places only
	(b) 0.1077981356	B2 (B1	for 0.1077(981...) for 5.74(45626...) or 53.29 or 0.11 or 0.107 or 0.108)	
2	260 to 260.5	M1	for $883 - 245 (=638)$ or $883 \div 245 (=3.60...)$ or $883 \div 245 \times 100 (=360(.408...))$ oe	
		M1	for a complete method to find the percentage increase eg " $638 \div 245 \times 100 (=260(.408...))$ " or $883 \div 245 \times 100 - 100 (=260(.408...))$ oe	
		A1	Accept answers in the range 260 to 260.5	



Paper: IMA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
9	10	P1	he has used the wrong centre for a process to start to solve the problem eg $6 \times 9 (= 54)$ machine days needed or 12 (machine days used in first 3 days) or 42 (machine days needed after first 3 days) or 6 (machine days not used in first 3 days) or $3 + 4 + 5$ equivalent to 2 days with 6 machines or has used 48 machine days in first 9 days	eg $3 + 4 + 5 (= 12)$ eg $6 \times 9 - 12 (= 42)$ eg $3 + 2 + 1 = 6$ eg $12 \div 6 = 2$
		P1	for " 42 " $\div 6 (= 7)$ (more days needed) or $3 \text{ days} - 2$ (equivalent) days $(= 1)$ extra day needed to make up for the days not used	
		A1	cao	
10	1.8	P1	process to find the amount of interest before tax eg $28.80 \div 20 \times 100 (= 144)$ OR for equation which would lead to $(x =) 0.018, 1.8$ or 1.018 eg $0.2 \times 8000 \times x = 28.8$ or $\frac{8000(100+x)}{100} = 8144$	
		P1	process to find the interest rate eg $\frac{144}{8000} (= 0.018)$ or $\frac{8144}{8000} (= 1.018)$	These numerical expressions may be seen multiplied by 100, eg $\frac{144}{8000} \times 100$
		A1	cao	



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
5	20	P1	for process to find SP of 24 chocolate bars, eg. $0.50 \times 24 (= 12)$ oe or for process to find the overall profit eg $(24 \times 0.5) - 10 (= 2)$ or for process to find CP of one chocolate bar, eg. $1000 \div 24 (= 41.66\dots)$ oe	Working can be carried out in either pounds or pence.
		P1	(dep) for start to a process to find percentage profit, eg. using $\frac{12-10}{10}$ or $\frac{12}{10}$ or $\frac{50-41.66\dots}{41.66\dots}$ oe with consistent units	
		A1	cao	
6	85 with working and reasons	M1	for correct use of corresponding angles eg $AEB = 63$ or co-interior angles eg $BCD = 180 - 148 (= 32)$ or $DEB = 180 - 63 (= 117)$	Angles must be clearly labelled on the diagram or otherwise identified. Full solution must be seen.
		M1	(dep) for a complete method to find angle EAB eg. $180 - 63 - (180 - 148)$ or $148 - 63$ or $117 - (180 - 148)$	Correct method can be implied from angles on the diagram if no ambiguity or contradiction.
		A1	for $EAB = 85$ (identified)	
		C2	(dep on M2) all working correct with all appropriate reasons stated. <u>Corresponding</u> angles are equal <u>Allied angles / Co-interior</u> angles add up to 180 <u>Angles</u> on a straight line add up to 180 <u>Angles</u> in a triangle add up to 180 The <u>exterior angle</u> of a triangle is <u>equal</u> to the sum of the <u>interior opposite angles</u> .	When reasons are given the key words underlined must be present. Reasons need to be linked to their method; any reasons not linked, do not credit. There should be no incorrect reasons given.
		(C1	for one reason relating to parallel lines clearly used and stated or for any two reasons clearly stated for their fully correct method)	



Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
7 (a)	4	B1	for 4	Condone (0,4) or 0,4 Accept both solutions given as a coordinate for M1 eg (5.2, 0.8) or (0.8, 5.2) or (5.2, 0) and (0.8, 0)
	(3, -5)	B1	cao	
	5.1 to 5.3 and 0.7 to 0.9	M1	for a correct method, eg marking both intercepts with x-axis or one correct solution	
		A1	for answers in the range 5.1 to 5.3 and 0.7 to 0.9	
8	12.5	M1	for $135 - 120 (= 15)$ or $\frac{135}{120} (= 1.125)$ or $\frac{135}{120} \times 100 (= 112.5)$	
		M1	for “15” $\div 120 \times 100$ or “112.5” $- 100$ or (“1.125” $- 1$) $\times 100$	
		A1	cao	
9	Yes with comparisons shown	M1	for starting to manipulate equation eg $y = \frac{3}{6}x + \frac{7}{6}$ or $y = \frac{1}{2}x + \frac{7}{6}$ or $3y = \frac{3}{2}x - 6 \times 3$ or $6y = 3x - 36$	Ignore constant terms for both marks
		A1	for statement and equation(s) which can be used to show that the gradients of the two lines are the same eg $y = \frac{1}{2}x + \frac{7}{6}$ and both have a gradient of $\frac{1}{2}$ or Yes, $6y = 3x - 36$ and both have the same x coefficients	



Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
3	60	P1	for process to find SP of 200 oranges or number of bags, eg $200 \div 5 (= 40)$ oe or for process to find the overall profit, eg $200 \div 5 - 25 (= 15)$ oe or for process to find CP of 1 orange, eg $25 \div 200 (= 0.125)$ oe or SP of 1 orange, eg $1 \div 5 (= 0.2)$ oe or for process to find CP of 5 oranges, eg $25 \div (200 \div 5) (= 0.625)$ oe or for process to find number of oranges bought per £, eg $200 \div 25 (= 8)$	Working can be in either pounds or pence SP = Selling Price CP = Cost Price 1.6 implies P1
		P1	(dep) for start to a process to find percentage profit, eg $\frac{40 - 25}{25} (= 0.6)$ oe or $\frac{15}{25} (= 0.6)$ oe or $\frac{40}{25} \times 100 (= 160)$ oe or $\frac{0.2 - 0.125}{0.125} (= 0.6)$ oe or $\frac{1}{0.625} \times 100 (= 160)$ oe or $\frac{1 - 0.625}{0.625} (= 0.6)$ oe or $\frac{8 - 5}{5} (= 0.6)$ oe or $\frac{8}{5} \times 100 (= 160)$ oe or $\frac{8 \times 15}{200} (= 0.6)$ oe	
		A1	cao	



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
3	30	P1	for full process to find the number of bags sold eg $5 \times 1000 \div 250 (= 20)$ OR for process to find selling price of 1 kg of sweets eg $0.65 \times 4 (= 2.60)$	This could be by repeated addition Calculations can be in £ or pence
		P1	for [number of bags] $\times 0.65$ or $"20" \times 0.65 (= 13)$ or $"2.60" \times 5 (= 13)$ OR for $10 \div "20"$ oe $(= 0.50)$ OR for $0.65 \times 4 (= 2.60)$ and $10 \div 5 (= 2)$	[number of bags] can only come from $5 \times 10 \div 250 (= 0.2)$ or $5 \times 100 \div 250 (= 2)$ or $5 \div 250 (= 0.02)$
		P1	(dep on previous P1) for a process to find the percentage profit eg $(("13" - 10) \div 10 \times 100)$ or $(0.65 - "0.50") \div "0.50" \times 100$ or $(("2.60" - "2") \div "2" \times 100)$ OR $"13" \div 10 \times 100 (= 130)$ oe	3/10 or 0.3 is not enough but should be awarded 2 marks Award P3 for 130(%)
		A1	cao	



Paper: IMA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
4	Rahim and correct figures	P1 A1 C1	for start to the process to find 20% for Tamara, eg 220000×0.2 oe (= 44000) or 30% for Rahim, eg 160000×0.3 oe (= 48000) OR for $1 - 0.2$ (= 0.8) or $100 - 20$ (= 80) or $1 + 0.3$ (= 1.3) or $100 + 30$ (= 130) P1 for a complete process to find at least one new value, eg $220000 - "44000"$ (= 176 000) or $160000 + "48000"$ (=208 000) OR $220000 \times "0.8"$ (=176 000) or $160000 \times "1.3"$ (= 208 000) A1 for one correct value, 176 000 or 208 000 C1 for correct conclusion supported by correct figures eg Rahim, 176 000 and 208 000	Build up processes are acceptable but must be complete and correct Award 0 marks for a correct answer with no supportive working
5	33	P1 P1 A1	for relating 24 to 8 parts or (1 part =) $24 \div 8$ (= 3) or for $15 - 7$ (= 8) or starts to use a build-up method, eg (8 :) 14 : 30 P1 for $15 - 4$ (= 11) and $24 \div 8$ (= 3) or 15×3 (= 45) and 4×3 (= 12) or for 12 (: 21) : 45 A1 cao	8 parts = 24



Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
4	Chic Decor with correct supporting evidence	P1	for process to find cost of 15 rolls from Chic Decor, eg $\frac{15}{3} \times 36$ (= 180) or for process to find cost of 15 rolls from Style Papers at normal price, eg $\frac{15}{5} \times 70$ (= 210) or for process to find cost of 1 roll from Chic Decor, eg $36 \div 3$ (= 12) or for process to find cost of 1 roll from Style Papers, eg $70 \div 5$ (= 14) or for process to find the cost of 5 rolls from Chic Decor, eg $\frac{36}{3} \times 5$ (= 60)	Could compare the costs for any number of rolls
		P1	for any first step in using the discount at Style Papers, eg $0.12 \times "210"$ (= 25.2(0)) or $0.12 \times "14"$ (= 1.68) or 0.12×70 (= 8.4(0)) or $1 - 0.12$ (= 0.88)	
		P1	for full process to find cost from Style Papers, eg. "210" – "25.2" oe (=184.8(0)) or "0.88" $\times$ "210" or for "14" – "1.68" oe (= 12.32) or "0.88" $\times$ "14" or for 70 – "8.4(0)" oe (= 61.6(0)) or "0.88" $\times$ 70	
		C1	for Chic Decor with fully correct figures eg 180 and 184.8(0) or 12 and 12.32 or 60 and 61.6(0)	



Paper: IMA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
1 (a)	$13y - 1$	M1	for method to expand one bracket or collect like terms, eg $3 \times 2y - 3 \times 5$ ($= 6y - 15$) or $7 \times y + 7 \times 2$ ($= 7y + 14$) or $3 \times 2y + 7 \times y$ ($= 6y + 7y$) or $3 \times -5 + 7 \times 2$ ($= -15 + 14$)	May be implied by $13y$ or -1
		A1	oe	
		B2	oe	
		(B1	for $3(2x^2 + 5x)$ or $x(6x + 15)$ or $3x(ax + b)$)	
		M1	for correct first step to rearrange, eg $f - 11 = 3g + 11 - 11$ or $f - 11 = 3g$ or $\frac{f}{3} = \frac{3g}{3} + \frac{11}{3}$ or $-3g = 11 - f$ or answer ambiguously shown, eg $g = f - 11 \div 3$ or given as $\frac{f - 11}{3}$	
(b)	$3x(2x + 5)$	A1	oe	May be seen in different equivalent forms
		B2	oe	
		(B1	for $3(2x^2 + 5x)$ or $x(6x + 15)$ or $3x(ax + b)$)	
		M1	for correct first step to rearrange, eg $f - 11 = 3g + 11 - 11$ or $f - 11 = 3g$ or $\frac{f}{3} = \frac{3g}{3} + \frac{11}{3}$ or $-3g = 11 - f$ or answer ambiguously shown, eg $g = f - 11 \div 3$ or given as $\frac{f - 11}{3}$	
(c)	$g = \frac{f - 11}{3}$	A1	oe	May be seen in different equivalent forms
		B2	oe	
		(B1	for $3(2x^2 + 5x)$ or $x(6x + 15)$ or $3x(ax + b)$)	
		M1	for correct first step to rearrange, eg $f - 11 = 3g + 11 - 11$ or $f - 11 = 3g$ or $\frac{f}{3} = \frac{3g}{3} + \frac{11}{3}$ or $-3g = 11 - f$ or answer ambiguously shown, eg $g = f - 11 \div 3$ or given as $\frac{f - 11}{3}$	
2	35	P1	for process to find income and outgoings, eg $7.5(0) \times 54$ ($= 405$) and $100 + 120 + 80$ ($= 300$)	
		P1	For process to find the profit, eg “405” – “300” ($= 105$) or “405” $\div$ “300” ($= 1.35$) or “405” $\div$ “300” $\times 100$ ($= 135$)	
		P1	for a full process to find percentage profit, eg (“105” $\div$ “300”) $\times 100$ or (“1.35” – 1) $\times 100$ or “135” – 100	
		A1	cao	

Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
6	Yes (supported)	P1	for start to a process to find a percentage increase, eg $87 - 76 (= 9)$ or $66 - 65 (= 1)$ or $\frac{85}{76} (= 1.118...)$ or $\frac{66}{65} (= 1.015...)$	Accept use of rounded and truncated figures for all marks
		P1	for process to find a % increase, eg $\frac{9}{76} \times 100 (= 11.84...)$ or $\frac{1}{65} \times 100 (= 1.53...)$ or $\frac{85}{76} \times 100 - 100 (= 11.84...)$ oe or $\frac{66}{65} \times 100 - 100 (= 1.53...)$ oe	May work in decimals or equivalent proportions throughout
		P1	for processes to find both % increases, eg $\frac{9}{76} \times 100 (= 11.84...)$ and $\frac{1}{65} \times 100 (= 1.53...)$ or $\frac{85}{76} \times 100 - 100 (= 11.84...)$ oe and $\frac{66}{65} \times 100 - 100 (= 1.53...)$ oe	
		C1	for Yes supported by correct figures, eg $11(.842...) \div 1.5(38...) = 7.3$ to 8 or $11(.842...) \text{ and } 1.5(38...) \times 7 = 10(.766...)$ or $11(.842...) \div 7 = 1.57$ to 1.7 and $1.5(3...)$ or $0.11(842...) \text{ and } 0.10(766...)$	

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)	No with reason	C1	No with reason Acceptable examples It's 10% of the original price, not 10% of 440 He found the percentage of the new amount not the original amount He found 10% of the increased value The original price is £400 100% is £400 / 100% is not £440 / 110% is £440 10% is £40 / 10% is not £44 / 11% is £44 99% is 396 10% of 396 is 39.6(0) 110% of 396 is 435.6(0) He should have divided by 1.1 Not acceptable examples No, 440 minus 10% is not 396 100% is not £396 £440 is the price after the increase / The original price is not £440 He has to find 90% of 440 He has to find 110% of 440 It should be £484 Jim is correct / Yes	



Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
(b)	160	P1 P1 A1	for process to find the number sold in November, eg $180 \div 150 \times 100$ or $180 \div 1.5 (= 120)$ oe or for $0.75 \times 1.5 (= 1.125)$ oe or for $75 \times 1.5 (= 112.5)$ oe for a process to find the number sold in October, eg " $120 \div 75 \times 100$ " oe eg " $120 \div 0.75$ " or $180 \div "1.125"$ oe eg $180 \div "112.5" \times 100$ or [value] $\div 0.75$ oe cao	[value] can be any value they believe to be the number of bikes sold in November or 180
13	E C B H	B3 (B2) (B1)	for a fully correct table for 3 correct) for 2 correct)	
14	23.3	M1 A1	for a complete method eg $\frac{1}{2} \times 8.3 \times 9.8 \times \sin 35$ for answer in range 23.3 to 23.33	If an answer is shown in the range in working and then incorrectly rounded award full marks



Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
3	No (supported)	P1	for start to process, eg. $2100 \times \frac{40}{100}$ (= 840) or $100 - 40$ (= 60)	May compare bonus shares of a single salesman or total bonus share for all 7 salesmen.
		P1	for process to find the 7 salesmen's share of bonus, eg $2100 - "840"$ (= 1260) or $2100 \times \frac{60}{100}$ (= 1260)	
		P1	for process to find bonus amount each salesman gets eg $"1260" \div 7$ (= 180) OR process to find the total bonus for all salesmen if shared equally, eg $\frac{2100}{10} \times 7$ (= 1470)	
		P1	for process to compare what a single salesman gets under each scheme, eg $"180" \times \frac{25}{100}$ (= 45) and $\frac{2100}{10} - "180"$ (= 30) or $"180" \times \frac{25}{100}$ (= 45) and $"180" + "45"$ (= 225) oe and $\frac{2100}{10}$ (= 210) or $(\frac{2100}{10} - "180") \div "180" \times 100$ (= 16.6...) OR process to compare what all salesmen gets under each scheme, eg $"1260" \times \frac{25}{100}$ (= 315) and $"1470" - "1260"$ (= 210) or $"1260" \times \frac{25}{100}$ (= 315) and $"1260" + "315"$ (= 1575) oe and $"1470"$ or $(\frac{2100}{10} - "1260") \div "1260" \times 100$ (= 16.6...)	
		A1	'No' supported by correct figures, eg 45 and 30, 225 and 210, 315 and 210 or 1575 and 1470 or 16.6...)(% and 25%)	Do not award unless correct figures have been shown to support a statement made that the salesman was not correct.



Paper: 1MA1/2H				
Question	Answer	Mark	Mark scheme	Additional guidance
8 (a)	580	M1	for method to find value before increase eg $551 \div 0.95$	$6000 \times 1.024 \times 1.017^2$ scores M2 If correct answer is stated then subsequently rounded isw and award 3 marks If correct answer stated and then interest only given as the answer award M2A0
		A1	cao	
	6354.67	M1	for 6000×1.024 oe (= 6144)	
		M1	for “6144” $\times 1.017^2$ oe	
(b)		A1	for 6354.66 or 6354.67 or 6354.68	
9	Two changes	C1	plot the median at 162, not 161 oe	
		C1	plot the upper quartile at 171, not 172 oe Acceptable examples the median has been plotted at 161 / upper quartile at 172 the upper quartile should be 171 (not 172) UQ is wrong as IQR is 17 not 18 Not acceptable examples the median / upper quartile have been plotted / drawn wrong the upper quartile has been worked out incorrectly She needs to work out the UQ	

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
1 (a)	m^6	B1	cao	
(b)	x^{13}	B1	cao	
(c)	$4p^3 + 12p^2$	B2	for $4p^3 + 12p^2$	
		(B1	for expanding the bracket to get $p^3 + 3p^2$ or $4p^3$ or $12p^2$)	
2 (a)	11533	P1	for working with 68%, eg 800×0.68 (= 544 people) oe or “16960” $\times$ 0.68 oe	Percentage calculation could be done at any stage
		P1	for a correct process, other than that of finding a %, eg “544” $\times$ 2 (= 1088) or 10.6×2 (= 21.2) or 800×2 (= 1600) or “544” $\times$ 10.6 (= 5766.4) or 800×10.6 (= 8480)	
		P1	for full process to find amount of coffee required eg “1088” $\times$ 10.6 or “544” $\times$ “21.2” or “5766.4” $\times$ 2 (= 11532.8) or for an answer of 11532	
		A1	for answer in the range 11532.5 to 11533	An answer within the range shown in working but incorrectly rounded gets full marks.
(b)	Statement	C1	for a correct statement Acceptable examples the amount will be more he will need more coffee it is an underestimate my answer in part (a) means there would not be enough for everyone he will need 12211(.2) needs 678(.4) more Not acceptable examples amount will decrease amount of coffee will change	If figures are given as part of the answer they must be correct, but can allow ft.

Paper: 1MA1/3H				
Question	Answer	Mark	Mark scheme	Additional guidance
5	45.6	P1	for a process to start to work with the ratio, eg $240 \div (3 + 5) (= 30)$ or pens = $3n$ and pencils = $5n$ where n is a positive integer	Can work in £ or pence but must be consistent, 90 or 150 imply P1 This mark can be awarded at any stage
		P1	for a complete process to find the number of pens and pencils, eg " $30" \times 3 (= 90)$ and " $30" \times 5 (= 150)$ OR for process to find one cost or amount to sell for one item eg [pens] $\times 9 (= 810)$ or [pens] $\times 11 (= 990)$ or [pencils] $\times 6 (= 900)$ or [pencils] $\times 10 (= 1500)$ OR process to find the profit for one pen or one pencil eg $11 - 9 (= 2)$ or $10 - 6 (= 4)$	[pens] could be " $30" \times 3$ or their number of pens [pencils] could be " $30" \times 5$ or their number of pencils [pens] , [pencils] $\neq 1$
		P1	for a process to find the total cost to buy or the total amount to sell for both, eg [pens] $\times 9$ + [pencils] $\times 6 (= 1710)$ or [pens] $\times 11$ + [pencils] $\times 10 (= 2490)$ OR process to find the profit for one item eg [pens] $\times 11$ - [pens] $\times 9 (= 180)$ or [pens] $\times (11 - 9) (= 180)$ or [pencils] $\times 10$ - [pencils] $\times 6 (= 600)$ or [pencils] $\times (10 - 6) (= 600)$	180 or 600 or 780 implies P3 [pens] could be " $30" \times 3$ or their number of pens [pencils] could be " $30" \times 5$ or their number of pencils [pens] , [pencils] $\neq 1$
		P1	for a complete process to find the profit as a percentage or a decimal, eg $\frac{[2490] - [1710]}{[1710]} \times 100$ or $\frac{[2490] - [1710]}{[1710]} (= 0.456...)$ or for a process to find the amount to sell as a percentage of the cost eg $\frac{[2490]}{[1710]} \times 100 (= 145.6...)$	[2490] is their amount to sell for both pens and pencils [1710] is their cost of pens and pencils [2490] - [1710] may be [180] + [600]
		A1	answer in the range 45.6 to 45.62	If an answer is given in the range in working and then rounded incorrectly award full marks. A correct answer with no supportive working gets 0 marks