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

Ratio & Proportion (R1)

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

96 questions · 323 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

96 questions · 323 marks · 3 sub-topics

SUB-TOPIC R1a

RATIO

Sub-topic R1a · 56 questions · 183 marks · lowest tariff first



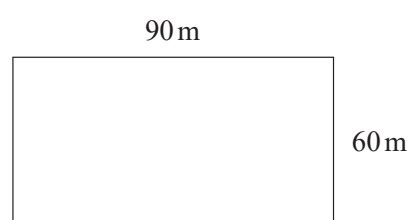
14 Write the ratio $4.5 : 2.25$ in the form $n : 1$

(Total for Question 14 is 1 mark)

15 A garden is in the shape of a rectangle 90 m by 60 m.

Flowers are grown in 40% of the garden.
The rest of the garden is grass.

Work out the area of the garden that is grass.



.....m²

(Total for Question 15 is 4 marks)

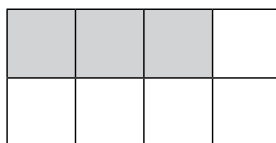


- 5 Change 4 kilometres into metres.

..... metres

(Total for Question 5 is 1 mark)

- 6 Here is a grid of squares.



Write down the ratio of the number of shaded squares to the number of unshaded squares.

.....

(Total for Question 6 is 1 mark)

- 7 $w = 4u + 3$

Find the value of w when $u = 8$

.....

(Total for Question 7 is 2 marks)

- 8 Here are the first five terms of a sequence.

1 3 6 10 15

Write down the next two terms of the sequence.

..... , ...

(Total for Question 8 is 2 marks)



21 Make a the subject of the formula $p = 3a - 9$

(Total for Question 21 is 2 marks)

22 Rob has been asked to divide 120 in the ratio 3:5

Here is his working.

$$120 \div 3 = 40$$

$$120 \div 5 = 24$$

Rob's working is not correct.

Describe what Rob has done wrong.

(Total for Question 22 is 1 mark)



21 Write 60 as a product of its prime factors.

(Total for Question 21 is 2 marks)

22 There are 48 counters in a bag.
There are only red counters and blue counters in the bag.

$$\text{number of red counters} : \text{number of blue counters} = 1 : 2$$

Helen has to work out how many red counters are in the bag.

She says,

“There are 24 red counters in the bag because 1 is half of 2 and 24 is half of 48”

Is Helen correct?

You must give a reason for your answer.

(Total for Question 22 is 1 mark)



- 9 Sean works for a company.
His normal rate of pay is £12 per hour.

When Sean works more than 8 hours a day, he is paid overtime for each hour he works more than 8 hours.

Sean's rate of overtime pay per hour is $1\frac{1}{4}$ times his normal rate of pay per hour.

On Monday Sean worked for 10 hours.

Work out the total amount of money Sean earned on Monday.

£.....

(Total for Question 9 is 4 marks)

- 10 A farmer has 20 boxes of eggs.
There are 6 eggs in each box.

Write, as a ratio, the number of eggs in two boxes to the total number of eggs.
Give your answer in its simplest form.

.....
(Total for Question 10 is 2 marks)



- 15 There are only red buttons, yellow buttons and orange buttons in a jar.
The number of red buttons, the number of yellow buttons and the number of orange buttons are in the ratio 7:4:9

Work out what percentage of the buttons in the jar are orange.

..... %

(Total for Question 15 is 2 marks)



18 Harry, Regan and Kelan share £450 in the ratio 2 : 5 : 3

How much money does Kelan get?

£.....

(Total for Question 18 is 2 marks)

19 Here is a list of ingredients for making 16 flapjacks.

Ingredients for 16 flapjacks

120 g butter
140 g brown sugar
250 g oats
2 tablespoons syrup

Jenny wants to make 24 flapjacks.

Work out how much of each of the ingredients she needs.

butter g

brown sugar g

oats g

syrup tablespoons

(Total for Question 19 is 3 marks)



6 Annie and Lily share some money in the ratio 4 : 3

(a) What fraction of the money does Lily get?

.....
(1)

Rosie and Dan share some sweets.

Dan gets $\frac{1}{4}$ of the sweets.

(b) Write down the ratio of the number of sweets Rosie gets to the number of sweets Dan gets.

.....
(1)

(Total for Question 6 is 2 marks)

7 Steve says,

“There are more prime numbers between 20 and 30
than there are between 10 and 20”

Is Steve right?

You must show how you get your answer.

(Total for Question 7 is 2 marks)



17 There are some chocolates in a box.

$\frac{1}{4}$ of the chocolates contain nuts.

The rest of the chocolates do not contain nuts.

Write down the ratio of the number of chocolates that contain nuts to the number of chocolates that do not contain nuts.

Give your answer in the form $1 : n$

(Total for Question 17 is 2 marks)



13 Azmol, Ryan and Kim each played a game.

Azmol's score was four times Ryan's score.

Kim's score was half of Azmol's score.

Write down the ratio of Azmol's score to Ryan's score to Kim's score.

.....
(Total for Question 13 is 2 marks)



15 Bert has 100 cards.

There is a whole number from 1 to 100 on each card.

No cards have the same number.

Bert puts a star on every card that has a multiple of 3 on it.

He puts a circle on every card that has a multiple of 5 on it.

Work out how many cards have both a star and a circle on them.

.....
(Total for Question 15 is 3 marks)

16 Write down the ratio of 450 grams to 15 grams.

Give your answer in its simplest form.

.....
(Total for Question 16 is 2 marks)



12 Ali, Ben and Cathy share an amount of money in the ratio 6 : 9 : 10

What fraction of the money does Ben get?

(Total for Question 12 is 2 marks)

13 The first term of a sequence of numbers is 24
The term-to-term rule of this sequence is ‘add 8’

Josie says,

“No number in this sequence is in the 5 times table.”

(a) Give an example to show that Josie is wrong.

(1)

(b) Is 85 a number in this sequence?
Give a reason for your answer.

(1)

(Total for Question 13 is 2 marks)



19 Adam, Linda and Rytis share an amount of money.

Linda gets three times as much money as Rytis gets.

Linda gets half as much money as Adam gets.

What fraction of the amount of money does Linda get?

.....
(Total for Question 19 is 2 marks)

20 Pens and pencils are sold in a shop.

12 pencils cost £1.80

The ratio of the cost of a pen to the cost of a pencil is 7 : 3

Work out the cost of 5 pens.

£.....

(Total for Question 20 is 4 marks)



15 There are only red beads and green beads in a bag.

number of red beads : number of green beads = 1 : 4

There are 35 red beads in the bag.

Work out the total number of beads in the bag.

(Total for Question 15 is 2 marks)



9 Harris is buying a shirt and a tie.
He has a choice of three colours of shirt and a choice of three styles of tie.

Shirt	Tie
White (W)	Plain (P)
Blue (B)	Striped (S)
Grey (G)	Checked (C)

Harris is going to choose one shirt and one tie.
List all the possible combinations Harris can choose.

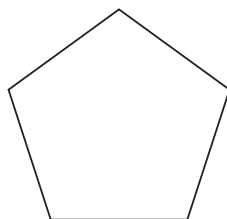
(Total for Question 9 is 2 marks)

10 There are 24 red counters and 40 blue counters in a bag.
Write down the ratio of the number of red counters to the number of blue counters in the bag.
Give your ratio in its simplest form.

(Total for Question 10 is 2 marks)



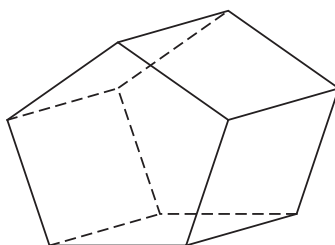
10 Here is a polygon.



(a) Write down the mathematical name of this polygon.

.....
(1)

Here is a prism.



Each edge of the prism has a length of 7.5 cm.

(b) Work out the total length of the edges of the prism.

..... cm
(2)

(Total for Question 10 is 3 marks)

11 There are only red counters, blue counters and green counters in a bag.

number of red counters : number of blue counters : number of green counters = 2 : 16 : 7

What fraction of the counters in the bag are green counters?

.....
(Total for Question 11 is 2 marks)

10 There are 24 cows and 36 sheep on a farm.

Write as a ratio the number of cows to the number of sheep.
Give your ratio in its simplest form.

.....
(Total for Question 10 is 2 marks)

11 (a) Work out $-12 \div -4$

.....
(1)

(b) Find the value of 2^5

.....
(1)

(c) Write **one** pair of brackets in this calculation so that the answer is correct.

$$30 \div 3 + 2 - 4 = 2$$

.....
(1)

(Total for Question 11 is 3 marks)



8 Junaïd says that 20 is a square number because $10^2 = 20$

- (a) Is Junaïd correct?
Give a reason for your answer.

(1)

Chloe says,

“When you divide an even number by an even number the answer is always an even number.”

- (b) Write down an example to show that Chloe is wrong.

(1)

(Total for Question 8 is 2 marks)

9 There are 90 red counters and 150 yellow counters in a bag.

Write down the ratio of the number of red counters to the number of yellow counters.
Give your ratio in its simplest form.

(Total for Question 9 is 2 marks)



- 10 20% of cars sold last year were electric cars.

Write down the ratio of

the number of electric cars sold last year to the number of non-electric cars sold last year.

Give your ratio in its simplest form.

.....
(Total for Question 10 is 2 marks)

- 11 Jamie drives his van for 150 minutes.
He stops for a rest.

Jamie then drives for a further 75 minutes.

- (a) Show that Jamie drives for less than 4 hours in total.

(2)

A car travels for 2 hours at a steady speed of 65 mph.

- (b) Work out the distance the car travels.

..... miles
(2)

(Total for Question 11 is 4 marks)



- 4 $\frac{4}{5}$ of a number is 32

Find the number.

.....
(Total for Question 4 is 2 marks)

- 5 A path is made of white tiles and grey tiles.

$\frac{1}{4}$ of the tiles are white.

- (a) Write down the ratio of white tiles to grey tiles.

.....
(1)

There is a total of 56 tiles.

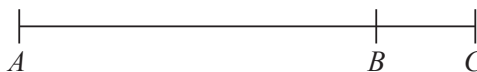
- (b) Work out the number of grey tiles.

.....
(2)

(Total for Question 5 is 3 marks)



10 ABC is a straight line.



The length AB is five times the length BC .

$AC = 90$ cm.

Work out the length AB .

.....cm

(Total for Question 10 is 3 marks)

11 $T = 4v + 3$

(a) Work out the value of T when $v = 2$

$T =$
(2)

(b) Make v the subject of the formula $T = 4v + 3$

.....
(2)

(Total for Question 11 is 4 marks)



- 11 The table shows a cricket club's income in 2016 from a fete, a quiz and membership fees.

	Income	
Fete	£250	
Quiz	Entry fees	13 at £5 each
	Refreshments	£35
Membership fees	25 at £20 each	

Express as a ratio

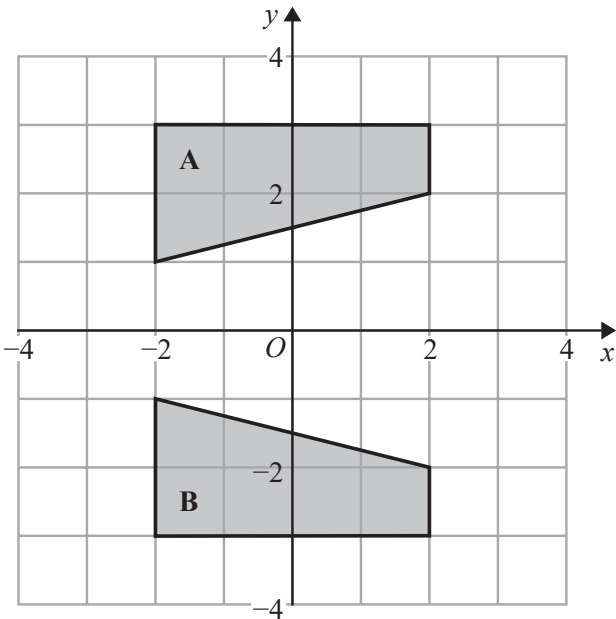
the income from the fete to the income from the quiz to the income from membership fees.

Give your ratio in its simplest form.

(Total for Question 11 is 3 marks)



14



Describe fully the single transformation that maps shape A onto shape B.

(Total for Question 14 is 2 marks)

15 The ratio of the cost of one metre of cotton fabric to the cost of one metre of silk fabric is 2 : 5

Complete the table of costs.

	2 m	6 m	8 m	9 m
cotton fabric	£6			
silk fabric				

(Total for Question 15 is 3 marks)



22 There are only blue pens, green pens and red pens in a box.

The ratio of the number of blue pens to the number of green pens is 2 : 5

The ratio of the number of green pens to the number of red pens is 4 : 1

There are less than 100 pens in the box.

What is the greatest possible number of red pens in the box?

.....
(Total for Question 22 is 3 marks)

23 (a) Find the value of the reciprocal of 1.6
Give your answer as a decimal.

.....
(1)

Jess rounds a number, x , to one decimal place.
The result is 9.8

(b) Write down the error interval for x .

.....
(2)

(Total for Question 23 is 3 marks)



20 In a village

the number of houses and the number of flats are in the ratio 7 : 4

the number of flats and the number of bungalows are in the ratio 8 : 5

There are 50 bungalows in the village.

How many houses are there in the village?

.....
(Total for Question 20 is 3 marks)



- 9 (a) A bag contains red counters and blue counters only.

number of red counters : number of blue counters = 3 : 4

Write down the fraction of the counters that are red.

.....
(1)

- (b) Write the ratio 12 : 30 in the form 1 : n

.....
(2)

(Total for Question 9 is 3 marks)

- 10 Jenny has 12 marbles.

$\frac{1}{4}$ of these 12 marbles are large.

The rest of these 12 marbles are small.

Each large marble has a weight of 70 grams.

Each small marble has a weight of 50 grams.

Work out the total weight of the 12 marbles.

..... grams

(Total for Question 10 is 4 marks)



- 14** Ishmael asked 30 students at college to tell him the sport they each like the best from cricket or tennis or swimming.

11 of the 20 female students said swimming.

2 of the male students said tennis.

5 students said cricket.

The number of male students who said cricket was the same as the number of male students who said swimming.

Complete the two-way table.

	Cricket	Tennis	Swimming	Total
Male students				
Female students				20
Total				30

(Total for Question 14 is 3 marks)

- 15** Jamil makes a drink by mixing
1 part of orange squash with 9 parts of water.

He uses 750 millilitres of orange squash.

Jamil is going to put the drink he has mixed into 1 litre bottles.

Work out the greatest number of 1 litre bottles that Jamil can completely fill.

(Total for Question 15 is 3 marks)



29 Given that $\frac{a}{b} = \frac{2}{5}$ and $\frac{b}{c} = \frac{3}{4}$

find $a:b:c$

(Total for Question 29 is 3 marks)



12 There are two drama groups in a school.

In one group there are 36 boys and 48 girls.

In the other group, $\frac{3}{7}$ of the students are boys and the rest of the students are girls.

Ann says,

“The ratio of the number of boys to the number of girls is the same for both groups.”

Is Ann correct?

You must show how you get your answer.

(Total for Question 12 is 3 marks)



24 Rosie, Matilda and Ibrahim collect stickers.

number of stickers : number of stickers : number of stickers
Rosie has : Matilda has : Ibrahim has = 4:7:15

Ibrahim has 24 more stickers than Matilda.

Ibrahim has more stickers than Rosie.

How many more?

(Total for Question 24 is 3 marks)



25 Last year a family recycled 800 kg of household waste.
57% of this waste was paper and glass.

weight of paper recycled : weight of glass recycled = 12 : 7

Calculate the weight of glass the family recycled.

..... kg

(Total for Question 25 is 3 marks)



- 17 Gita wants to make 24 litres of green paint.
She is going to mix blue paint, yellow paint and white paint in the ratio 4:3:1

She has

- 12 litres of blue paint
- 7 litres of yellow paint
- 5 litres of white paint.

Does Gita have enough blue paint, yellow paint and white paint to make 24 litres of green paint?

You must show how you get your answer.

(Total for Question 17 is 3 marks)



21 Sid, Tam and Musa share £6900 in the ratio 2 : 3 : 5

Work out how much money each person receives.

Sid £.....

Tam £.....

Musa £.....

(Total for Question 21 is 3 marks)



- 24 Kiaria is 7 years older than Jay.
Martha is twice as old as Kiaria.
The sum of their three ages is 77

Find the ratio of Jay's age to Kiaria's age to Martha's age.

(Total for Question 24 is 4 marks)



15 Shahid is going to use these instructions to make a fizzy drink.

Mix 5 parts of orange juice
with 2 parts of lemonade

Shahid thinks that he has 300 ml of orange juice and 200 ml of lemonade.

(a) If Shahid is correct, what is the greatest amount of fizzy drink he can make?

..... ml
(3)

Shahid has 300 ml of orange juice but he only has 160 ml of lemonade.

(b) Does this affect the greatest amount of fizzy drink he can make?
Give a reason for your answer.

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

(Total for Question 15 is 4 marks)



27 A shop sells packs of black pens, packs of red pens and packs of green pens.

There are

2 pens in each pack of black pens

5 pens in each pack of red pens

6 pens in each pack of green pens

On Monday,

number of packs of black pens sold : number of packs of red pens sold : number of packs of green pens sold = 7:3:4

A total of 212 pens were sold.

Work out the number of green pens sold.

(Total for Question 27 is 4 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)



- 21 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 21 is 4 marks)

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

Give your answer as a mixed number.

$\dots\dots\dots$

(Total for Question 22 is 3 marks)



- 22** The length of a pencil is 128 mm correct to the nearest millimetre.

Complete the error interval for the length of the pencil.

..... mm $\leq$ length < mm

(Total for Question 22 is 2 marks)

- 23** Tom and Adam have a total of 240 stamps.

The ratio of the number of Tom's stamps to the number of Adam's stamps is 3 : 7

Tom buys some stamps from Adam.

The ratio of the number of Tom's stamps to the number of Adam's stamps is now 3 : 5

How many stamps does Tom buy from Adam?

You must show all your working.

.....

(Total for Question 23 is 4 marks)



19 Adam, Linda and Rytis share an amount of money.

Linda gets three times as much money as Rytis gets.

Linda gets half as much money as Adam gets.

What fraction of the amount of money does Linda get?

.....
(Total for Question 19 is 2 marks)

20 Pens and pencils are sold in a shop.

12 pencils cost £1.80

The ratio of the cost of a pen to the cost of a pencil is 7 : 3

Work out the cost of 5 pens.

£.....

(Total for Question 20 is 4 marks)



19 Rachel, Samina and Tom share £600 between them.

Rachel gets $\frac{2}{5}$ of the £600

Samina gets $\frac{1}{4}$ of the money that is left over.

Tom gets the rest of the money.

Tom says,

“I would have got more money if we had shared the £600 equally between us.”

Is Tom correct?

You must show how you get your answer.

(Total for Question 19 is 4 marks)



13 In the Northern hemisphere the ratio of the area of land to the area of water is 2 : 3

(a) Work out what percentage of the area of the Northern hemisphere is land.

..... %
(2)

20% of the area of the Southern hemisphere is land.

(b) Work out the ratio of the area of land to the area of water in the Southern hemisphere.

.....
(2)

(Total for Question 13 is 4 marks)



22 Natalie makes potato cakes in a restaurant.

She mixes potato, cheese and onion so that

weight of potato : weight of cheese : weight of onion = 9 : 2 : 1

Natalie needs to make 6000 g of potato cakes.

Cheese costs £2.25 for 175 g.

Work out the cost of the cheese needed to make 6000 g of potato cakes.

£.....

(Total for Question 22 is 4 marks)



- 26 Chris, Debbie and Errol share some money in the ratio 3:4:2
Debbie gets £120

Chris then gives some of his share to Debbie and some of his share to Errol.
The money that Chris, Debbie and Errol each have is now in the ratio 2:5:3

How much money did Chris give to Errol?

£.....

(Total for Question 26 is 4 marks)

- 27 The bearing of port B from port A is 147°
Work out the bearing of port A from port B .

o

(Total for Question 27 is 2 marks)



25 Andy, Luke and Tina share some sweets in the ratio 1 : 6 : 14

Tina gives $\frac{3}{7}$ of her sweets to Andy.

Tina then gives $12\frac{1}{2}\%$ of the rest of her sweets to Luke.

Tina says,

“Now all three of us have the same number of sweets.”

Is Tina correct?

You must show how you get your answer.

(Total for Question 25 is 4 marks)



- 18** On Saturday, some adults and some children were in a theatre.
The ratio of the number of adults to the number of children was 5 : 2

Each person had a seat in the Circle or had a seat in the Stalls.

$\frac{3}{4}$ of the children had seats in the Stalls.

117 children had seats in the Circle.

There are exactly 2600 seats in the theatre.

On this Saturday, were there people on more than 60% of the seats?
You must show how you get your answer.

(Total for Question 18 is 5 marks)



18 Daniel bakes 420 cakes.

He bakes only vanilla cakes, banana cakes, lemon cakes and chocolate cakes.

$\frac{2}{7}$ of the cakes are vanilla cakes.

35% of the cakes are banana cakes.

The ratio of the number of lemon cakes to the number of chocolate cakes is 4:5

Work out the number of lemon cakes Daniel bakes.

.....
(Total for Question 18 is 5 marks)



23 Raya buys a van for £8500 plus VAT at 20%

Raya pays a deposit for the van.

She then pays the rest of the cost in 12 equal payments of £531.25 each month.

Find the ratio of the deposit Raya pays to the total of the 12 equal payments.

Give your answer in its simplest form.

(Total for Question 23 is 5 marks)



16 Alan, Bispah and Chan share a sum of money.

Alan gets $\frac{1}{8}$ of the money.

Bispah gets $\frac{1}{2}$ of the money.

Chan gets the rest of the money.

Alan gets £2.50

(a) Work out how much money Bispah gets.

£
(2)

(b) Find the ratio

amount of money Alan gets : amount of money Chan gets

Give your answer in the form $a:b$ where a and b are whole numbers.

.....
(3)

(Total for Question 16 is 5 marks)



23 Carlo puts tins into small boxes and into large boxes.

He puts 6 tins into each small box.

He puts 20 tins into each large box.

Carlo puts a total of 3000 tins into the boxes so that

number of tins in small boxes : number of tins in large boxes = 2 : 3

Carlo says that less than 30% of the boxes filled with tins are large boxes.

Is Carlo correct?

You must show all your working.

(Total for Question 23 is 5 marks)



25 A delivery company has a total of 160 cars and vans.

the number of cars : the number of vans = 3 : 7

Each car and each van uses electricity or diesel or petrol.

$\frac{1}{8}$ of the cars use electricity.

25% of the cars use diesel.

The rest of the cars use petrol.

Work out the number of cars that use petrol.

You must show all your working.

(Total for Question 25 is 5 marks)



- 18 There are 240 cans of drink on a shelf.
Each can contains cola or lemonade or orange.

the number of cans : the number of cans : the number of cans = 5:3:2
of cola of lemonade of orange

$\frac{1}{2}$ of the cans of lemonade and $\frac{1}{12}$ of the cans of orange are removed from the shelf.

Work out the number of cans of cola as a percentage of the total number of cans of drink remaining on the shelf.

.....%

(Total for Question 18 is 5 marks)



26 Kasim has some small jars, some medium jars and some large jars.
He has a total of 400 jars.

$\frac{3}{8}$ of the 400 jars are empty.

For the empty jars,

number of small jars : number of medium jars = 3 : 4

number of medium jars : number of large jars = 1 : 2

Work out the percentage of Kasim's jars that are empty small jars.

..... %

(Total for Question 26 is 5 marks)



24 Rizwan writes down three numbers a , b and c

$$a:b = 1:3$$

$$b:c = 6:5$$

(a) (i) Find $a:b:c$

.....
(2)

(ii) Express a as a fraction of the total of the three numbers a , b and c

.....
(2)

Emma writes down three numbers m , n and p

$$n = 2m$$

$$p = 5n$$

(b) Find $m:p$

.....
(2)

(Total for Question 24 is 6 marks)



22 There are 280 chocolates in a box.

There are only dark chocolates, milk chocolates and white chocolates.

$\frac{1}{7}$ of the 280 chocolates are dark chocolates.

The number of milk chocolates : the number of white chocolates = 1 : 3

The number of white chocolates : the number of dark chocolates = n : 1

(a) Work out the value of n .

You must show all your working.

$n = \dots\dots\dots$
(5)

10 milk chocolates from the box are eaten.

(b) Does this affect your answer to part (a)?

Give a reason for your answer.

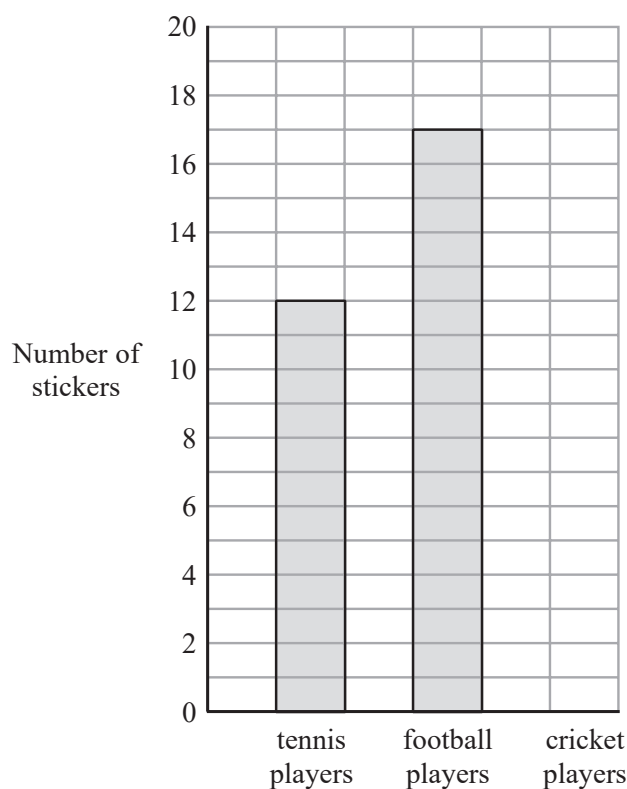
.....
.....
.....
(1)

(Total for Question 22 is 6 marks)



- 9 Milly collects stickers of sports players.
She only has stickers of tennis players, football players and cricket players.

The incomplete bar chart shows some information about the number of stickers Milly has.



Milly has a total of 40 stickers.

- (a) Complete the bar chart.

(3)

- (b) What fraction of the 40 stickers are stickers of tennis players?
Give your fraction in its simplest form.

(2)



Ewan also collects stickers.
He only has large stickers and small stickers.

For Ewan's stickers,

the number of large stickers : the number of small stickers = 5 : 4

(c) Write down the fraction of Ewan's stickers that are large stickers.

.....
(1)

(d) Write the ratio 5 : 4 in the form $n : 1$

.....
(1)

(Total for Question 9 is 7 marks)



SUB-TOPIC R1b

DIRECT & INVERSE PROPORTION

Sub-topic R1b · 6 questions · 15 marks · lowest tariff first



23 It takes 14 hours for 5 identical pumps to fill a water tank.

How many hours would it take 4 of these pumps to fill another water tank of the same size?

..... hours

(Total for Question 23 is 2 marks)



24 Ali buys packs of balloons and boxes of pencils.

There are 30 balloons in each pack.

There are 24 pencils in each box.

Ali buys exactly the same number of balloons and pencils.

Work out how many packs of balloons and how many boxes of pencils she could have bought.

You must show all your working.

..... packs of balloons

..... boxes of pencils

(Total for Question 24 is 3 marks)

25 A company orders a large number of plates from a factory.

It would take 30 hours to make all the plates using 4 machines.

How many machines are needed to make all the plates in 6 hours?

.....
(Total for Question 25 is 2 marks)



22 The number of hours, H , that some machines take to make 5000 bottles is given by

$$H = \frac{72}{n} \quad \text{where } n \text{ is the number of machines.}$$

On Monday, 6 machines made 5000 bottles.

On Tuesday, 9 machines made 5000 bottles.

The machines took more time to make the bottles on Monday than on Tuesday.

How much more time?

..... hours

(Total for Question 22 is 2 marks)



23 It would take 120 minutes to fill a swimming pool using water from 5 taps.

(a) How many minutes will it take to fill the pool if only 3 of the taps are used?

..... minutes
(2)

(b) State one assumption you made in working out your answer to part (a).

.....
(1)

(Total for Question 23 is 3 marks)

24 A plane travels at a speed of 213 miles per hour.

(a) Work out an estimate for the number of seconds the plane takes to travel 1 mile.

..... seconds
(3)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

.....
(1)

(Total for Question 24 is 4 marks)



28 The number of days, d , that it will take to build a house is given by

$$d = \frac{720}{n}$$

where n is the number of workers used each day.

Ali's company will take 40 days to build the house.

Hayley's company will take 30 days to build the house.

Hayley's company will have to use more workers each day than Ali's company.

How many more?

.....
(Total for Question 28 is 3 marks)



- 16** Water flows through each of the pipes that fill a lake at the same rate.
It takes 4 of the pipes 12 hours to fill the lake.

Work out how many hours it would take 6 pipes to fill $\frac{1}{4}$ of the lake.

..... hours

(Total for Question 16 is 3 marks)



SUB-TOPIC R1c

BEST BUYS, RECIPES & SCALING

Sub-topic R1c · 34 questions · 125 marks · lowest tariff first



11 Jack's driving school has two offers.

Offer 1

First driving lesson free
All other driving lessons normal price

Offer 2

All driving lessons
5% off the normal price

The normal price of a driving lesson is £24

Douglas is going to have 12 driving lessons.

Which is the cheaper offer for 12 driving lessons, Offer 1 or Offer 2?
You must show how you get your answer.

(Total for Question 11 is 3 marks)

12 2.5 kg of apples cost £3.60

Work out the cost of 3.5 kg of apples.

£.....

(Total for Question 12 is 2 marks)



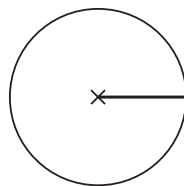
- 8 3 kg of meat costs £54
Nina buys 2 kg of the meat.

Work out how much Nina pays.

£

(Total for Question 8 is 2 marks)

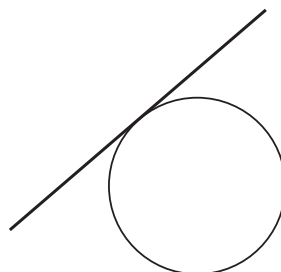
- 9 The centre of this circle is marked with a cross (×).



- (a) Write down the mathematical name of the straight line shown in the circle.

.....
(1)

- (b) Write down the mathematical name of the straight line that is touching the circle.



.....
(1)

(Total for Question 9 is 2 marks)

18 Here is a list of ingredients for making 10 scones.

Ingredients for 10 scones

75 g	butter
350 g	self-raising flour
40 g	sugar
150 ml	milk
2	eggs

Mia wants to make 25 scones.
Work out how much sugar she needs.

..... g

(Total for Question 18 is 2 marks)

19 Increase 240 by 20%

.....

(Total for Question 19 is 3 marks)



15 Work out $\frac{6}{7} \times \frac{5}{12}$

Give your answer as a fraction in its simplest form.

(Total for Question 15 is 2 marks)

16 Here is the list of ingredients for making 20 biscuits.

Ingredients for 20 biscuits

150 g butter
100 g sugar
250 g flour

Harry wants to make 60 biscuits.

How much flour does Harry need?

..... g

(Total for Question 16 is 2 marks)



18 Harry, Regan and Kelan share £450 in the ratio 2 : 5 : 3

How much money does Kelan get?

£.....

(Total for Question 18 is 2 marks)

19 Here is a list of ingredients for making 16 flapjacks.

Ingredients for 16 flapjacks

120 g butter
140 g brown sugar
250 g oats
2 tablespoons syrup

Jenny wants to make 24 flapjacks.

Work out how much of each of the ingredients she needs.

butter g

brown sugar g

oats g

syrup tablespoons

(Total for Question 19 is 3 marks)



- 20** In London, 1 litre of petrol costs 108.9p
In New York, 1 US gallon of petrol costs \$2.83

1 US gallon = 3.785 litres

£1 = \$1.46

In which city is petrol better value for money, London or New York?
You must show your working.

(Total for Question 20 is 3 marks)

- 21** A gold bar has a mass of 12.5 kg.

The density of gold is 19.3 g/cm^3

Work out the volume of the gold bar.

Give your answer correct to 3 significant figures.

..... cm^3

(Total for Question 21 is 3 marks)



17 Here is the list of ingredients for making 30 biscuits.

Ingredients for 30 biscuits

225 g butter
110 g caster sugar
275 g plain flour
75 g chocolate chips

Lucas has the following ingredients.

900 g butter
1000 g caster sugar
1000 g plain flour
225 g chocolate chips

What is the greatest number of biscuits Lucas can make?
You must show your working.

(Total for Question 17 is 3 marks)



- 14** A shop sells compost in 20 litre bags and in 40 litre bags.
One day the shop had two special offers for the compost.



2 bags for £3.50



3 bags for £9

Which offer is the better value for money?
You must show how you get your answer.

(Total for Question 14 is 3 marks)

19 Here are the ingredients needed to make 16 biscuits.

Biscuits

Ingredients to make **16** biscuits

175 g of butter

75 g of sugar

250 g of flour

Anna has

500 g of butter

300 g of sugar

625 g of flour

Work out the greatest number of biscuits Anna can make.

(Total for Question 19 is 3 marks)



- 11** Sinita wants to make 35 picture frames.
She needs 4 nails for each frame.

Sinita has 3 boxes of nails.
There are 48 nails in each box.

Has Sinita got enough nails to make all 35 frames?
Show how you get your answer.

(Total for Question 11 is 3 marks)

- 12** Write 60 metres as a fraction of 1000 metres.
Give your answer in its simplest form.

(Total for Question 12 is 2 marks)



10 Here are the ingredients needed to make 20 peanut butter cookies.

Makes 20 cookies

250 g peanut butter

200 g sugar

2 small eggs

Derek wants to make 60 cookies.

He has 900 g of peanut butter.

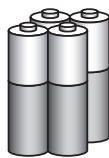
Does Derek have enough peanut butter to make 60 cookies?

You must show how you get your answer.

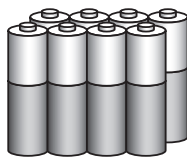
(Total for Question 10 is 3 marks)



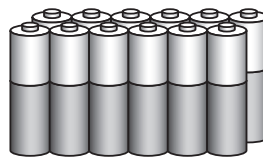
16 Batteries are sold in packs of 4, in packs of 8 and in packs of 12



£1.80



£3.20



£6.00

A pack of 4 batteries costs £1.80

A pack of 8 batteries costs £3.20

A pack of 12 batteries costs £6.00

Which pack gives the best value for money?

You must show how you get your answer.

(Total for Question 16 is 3 marks)



17 Here are the ingredients needed to make 20 shortbread biscuits.

Ingredients for 20 shortbread biscuits

120 g of butter
200 g of flour
50 g of sugar

Heidi wants to make 30 shortbread biscuits.
How much of each ingredient will Heidi need?

butter g
flour g
sugar g

(Total for Question 17 is 3 marks)

22

Choci bar

200 g

£3.50

London**Choci bar**

360 g

7.20 Swiss francs

Zurich

In London, a 200 g Choci bar costs £3.50

In Zurich, a 360 g Choci bar costs 7.20 Swiss francs.

The exchange rate is £1 = 1.25 Swiss francs.

In which city is the Choci bar the better value for money, in London or in Zurich?

You must show how you get your answer.

(Total for Question 22 is 3 marks)



17 Sam wants to use this recipe to make 15 pancakes.

Ingredients for 10 pancakes

100 g flour
200 ml milk
40 g butter
2 eggs

Sam has

200 g flour
250 ml milk
70 g butter
5 eggs

Does Sam have enough flour, enough milk, enough butter and enough eggs to make 15 pancakes?

You must show all your working.

(Total for Question 17 is 3 marks)



10 Suha is going to buy 150 envelopes.

Here is some information about the cost of envelopes in two shops.

Letters2send

Pack of 25 envelopes for £3.49

Stationery World

Pack of 10 envelopes for £2.10
Buy 2 packs get 1 pack free

Suha wants to buy the envelopes as cheaply as possible.

Which shop should Suha buy the 150 envelopes from?

You must show how you get your answer.

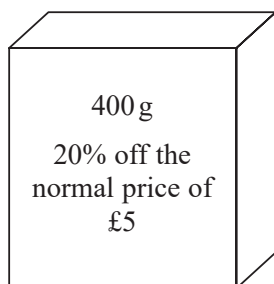
(Total for Question 10 is 4 marks)



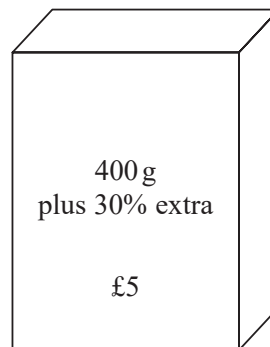
18 Food Mart and Jan's Store sell boxes of the same type of breakfast cereal.

Each shop has a special offer.

Food Mart



Jan's Store



Which box of cereal is the better value for money?
You must show your working.

(Total for Question 18 is 4 marks)



7 Shaun is 1.88 m tall.

David is 6 cm taller than Shaun.

How tall is David?

.....
(Total for Question 7 is 2 marks)

8 2 pens cost £2.38
5 folders cost £5.60

Ben wants to buy 20 pens and 20 folders.
He only has £50

Does Ben have enough money to buy 20 pens and 20 folders?
You must show how you get your answer.

(Total for Question 8 is 4 marks)



- 17 There are 84 calories in 100 g of banana.
There are 87 calories in 100 g of yogurt.

Priti has 60 g of banana and 150 g of yogurt for breakfast.

Work out the total number of calories in this breakfast.

.....
(Total for Question 17 is 4 marks)



18 Machine A and machine B both make car parts.

Machine A makes 6 parts every 10 minutes.

Machine B makes 13 parts every 15 minutes.

On Monday

machine A makes parts for 12 hours

machine B makes parts for 10 hours

Work out the total number of parts made by the two machines on Monday.

(Total for Question 18 is 4 marks)



- 14** 3 kg of carrots cost £1.80
2 kg of carrots and 5 kg of potatoes cost a total of £3.45

Work out the total cost of 4 kg of carrots and 2 kg of potatoes.
You must show all your working.

£.....

(Total for Question 14 is 4 marks)



13 A shop has two different special offers on milk.



75p

Pay for 2 bottles
get 1 bottle free



£1.28

Pay for 1 bottle
get 1 bottle half price

Which offer gives the better value for money?
You must show how you get your answer.

(Total for Question 13 is 4 marks)

20 Here is a list of ingredients for making 10 scones.

Ingredients for 10 scones

80 g butter
350 g self-raising flour
30 g sugar
2 eggs

Martin has

100 g butter
1 kg self-raising flour
50 g sugar
4 eggs

Martin wants to make 25 scones.

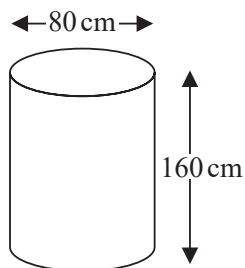
He has not got enough of some of the ingredients.

Work out how much more of each of these ingredients he needs.

(Total for Question 20 is 4 marks)



- 24 Karina has 4 tanks on her tractor.
Each tank is a cylinder with diameter 80 cm and height 160 cm.



The 4 tanks are to be filled completely with a mixture of fertiliser and water.

The fertiliser has to be mixed with water in the ratio 1 : 100 by volume.
Karina has 32 litres of fertiliser.

$$1 \text{ litre} = 1000 \text{ cm}^3$$

Has Karina enough fertiliser for the 4 tanks?
You must show how you get your answer.

(Total for Question 24 is 4 marks)



10 Max sees this special offer in a shop.

Buy one large plate and get one small plate for half the normal price.

The normal price of a large plate is £2

The normal price of a small plate is 80p

Max wants to buy 6 large plates and 6 small plates using this offer.

He has £15

Has Max got enough money?

You must show how you get your answer.

(Total for Question 10 is 4 marks)



Rowena stayed at the beach for $1\frac{1}{2}$ hours.

She then drove home without stopping.

Rowena arrived home at 1600

(b) On the grid, complete the travel graph.

(2)

(c) Work out the average speed for the journey from the beach to Rowena's home.

..... miles per hour
(1)

(Total for Question 13 is 5 marks)

14 120 boxes cost £6
270 bags cost £10

A bag is cheaper than a box.

How much cheaper?

Give your answer in pence correct to 1 decimal place.

.....p

(Total for Question 14 is 4 marks)



- 25** In London, 2 kg of carrots cost £3.75
In New York, 5 lbs of carrots cost 4.90 US dollars.

£1 = 1.20 US dollars

1 kg = 2.2 lbs

In which city are carrots better value for money, London or New York?
You must show how you get your answer.

(Total for Question 25 is 4 marks)



23 Deon needs 50 g of sugar to make 15 biscuits.

She also needs

three times as much flour as sugar

two times as much butter as sugar

Deon is going to make 60 biscuits.

(a) Work out the amount of flour she needs.

..... g
(3)

Deon has to buy all the butter she needs to make 60 biscuits.
She buys the butter in 250 g packs.

(b) How many packs of butter does Deon need to buy?

.....
(2)

(Total for Question 23 is 5 marks)



- 17 Scott wants to make orange juice.
He is going to buy boxes of oranges.

There are 24 oranges in each box of oranges.
--

30 oranges make 2 litres of orange juice.

Scott needs to buy enough oranges to make 8 litres of orange juice.

- (a) Work out the number of boxes of oranges that Scott needs to buy.
You must show all your working.

.....
(3)

Scott also buys
1260 apples
280 bananas

- (b) Write down the ratio of the number of apples that Scott buys to the number of
bananas that he buys.
Give your ratio in its simplest form.

.....
(2)

(Total for Question 17 is 5 marks)



15 Here are the costs of the same type of batteries in two shops.

Shop A	Shop B
Pack of 4 batteries £1.60	Pack of 6 batteries £2.70

Harry needs to buy at least 30 batteries.

He assumes that he has to buy batteries in whole packs.

Harry wants to buy the batteries as cheaply as possible from the same shop.

- (a) Which shop should he buy the batteries from, shop A or shop B?
You must show all your working.

(4)

Harry's assumption is wrong.

He can buy single batteries for 40p each in shop A and for 45p each in shop B.

- (b) Does this affect which of these two shops Harry should buy the batteries from?
Give a reason for your answer.

(1)

(Total for Question 15 is 5 marks)



26 Maisie knows that she needs 3 kg of grass seed to make a rectangular lawn 5 m by 9 m.

Grass seed is sold in 2 kg boxes.

Maisie wants to make a rectangular lawn 10 m by 14 m.

She has 5 boxes of grass seed.

- (a) Has Maisie got enough grass seed to make a lawn 10 m by 14 m?
You must show all your working.

(4)

Maisie opens the 5 boxes of grass seed.

She finds that 4 of the boxes contain 2 kg of grass seed.

The other box contains 1 kg of grass seed.

- (b) Does this affect whether Maisie has enough grass seed to make her lawn?
Give a reason for your answer.

(1)

(Total for Question 26 is 5 marks)



17 Heidi wants to make some biscuits using this recipe.

Makes 12 biscuits

125 g butter

200 g flour

50 g sugar

Heidi thinks that she has,

500 g butter

700 g flour

250 g sugar

Assuming that these weights are correct,

- (a) work out the greatest number of biscuits Heidi can make.
You must show all your working.

.....
(4)

Heidi is wrong.

She has more than 250 g of sugar.

- (b) Does this affect the greatest number of biscuits Heidi can make?
Give a reason for your answer.

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

.....
(Total for Question 17 is 5 marks)



- 15 2.5 kg of onions and 2 kg of carrots cost a total of £2.36
3 kg of carrots cost £1.74

Stuart has £2

He wants to buy 4 kg of onions.

Does Stuart have enough money to buy 4 kg of onions?

You must show how you get your answer.

(Total for Question 15 is 5 marks)



18 Asha buys 180 cans of cola.

The cans are sold in packs.
There are 12 cans in each pack.
Each pack costs £3

(a) Work out the total cost of the cola Asha buys.

£.....
(3)

Ethan buys a box of 24 cans of lemonade for £7
There are 330 ml of lemonade in each can.

(b) Work out the cost of 100 ml of lemonade.
Give your answer correct to the nearest penny.

.....p
(3)

(Total for Question 18 is 6 marks)



MARK SCHEMES

official mark schemes, in the same order as the questions



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
11	23	M1	for substitution eg. 7×5 and 3×-4 or $7(5) + 3(-4)$	$7 \times 5 (= 35)$ and $3 \times -4 (= -12)$ may be seen separately but both must be seen for the award of M1
		A1	cao	
12 (a)	7	B1	cao	
(b)	1 hr 38 mins	M1	for a complete method to find the time difference eg. $9\ 00 - 7\ 22$ OR a calculation on a number line, may be seen in any time format OR work in parts eg hours and minutes, may work in any units, eg. $60 - 22 (= 38) + 1$ hour OR a clear build up method from 07 22 to 09 00 OR for correct values seen in an incorrect format, eg. 1.38 or 1:38 or 98 without units	
		A1	1 hr 38 (mins) or 98 minutes or 1.63' hrs	
13	10	P1	for starting the problem, $12 \div 6 (=2)$	The square of side 2 cm may be just seen on the diagram
		P1	for a complete process to find width " 2 " $\times 5$	
		A1	cao	
14	2 : 1	B1	cao	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	Two correct factors	B1	for 2 correct factors from 1, 2, 3, 4, 6, 12 and no incorrect factors	Accept one correct product
2	10	B1	cao	
3	$\frac{7}{10}$	B1	for $\frac{7}{10}$ or for any other equivalent fraction	Eg $\frac{70}{100}$
4	18	B1	cao	
5	4000	B1	cao	
6	3 : 5	B1	for 3 : 5 or for any other equivalent ratio	
7	35	M1 A1	for $4 \times 8 (=32)$ cao	Award this mark if used ambiguously eg $4 \times 8 + 3 = 4 \times 11$ as long as 4×8 is stated
8	21, 28	B2 (B1	both correct one correct in the correct position or for $15 + 6 (= a)$ or $a + 7 (= b)$ where $a \neq 21$ and $b \neq 28$)	May be written alongside the given sequence but if contradiction accept the answer line. If both correct, accept in either order. May be seen as "+6" next to the sequence



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
20 (a)	1.765(2...)	M1	for fully evaluating the numerator or denominator, eg 18.3... or 10.4(1) or answer of 1.76 or 1.77 or digits 1765(2...)	Answer must be given to at least 3 decimal places rounded or truncated. Check first 4 significant figures only.
		A1	for 1.765(2.....)	
	(b) 1.6	B1	for 1.6 oe	
21	$2 \times 2 \times 3 \times 5$	M1	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 or for 2, 2, 3, 5 (1)	Condone the inclusion of 1 for the method mark Accept $2^2 \times 3 \times 5$
		A1	for $2 \times 2 \times 3 \times 5$ oe	
22	No with reason	C1	for No and valid reason, eg compares $\frac{1}{3}$ with $\frac{1}{2}$ or 16 (with 24) Acceptable examples No, $\frac{1}{3}$ are red not $\frac{1}{2}$ There are 16 red counters (not 24) No as she has used the ratio 1:1 (not 1:2) Incorrect as it is 16 : 32 No as she should divide by 3 (as $1 + 2 = 3$) No as they would both be 24 so it doesn't fit in the ratio 1 : 2 No because $24 + 48 = 72$ Not acceptable examples Yes, ... No as the number of red counters would be lower There is 1 red for every 2 blue	



Paper: 1MA1/1F				
Question	Working	Answer	Mark	Notes
8 (a)		$\frac{15}{32}$	B1	oe
(b)		$\frac{5}{12}$	M1 A1	uses a correct common denominator with at least one correct matching numerator e.g. $\frac{8}{12}$, $\frac{3}{12}$
9		126	P1 P1 P1 A1	for working with time, eg $10 - 8(=2)$ or $12 \times 8(=96)$ or $12 \times 10(=120)$ for working with overtime, eg $12 \div 4(=3)$ or $1.25 \times "2" (=2.5)$ or $0.25 \times "2" (=0.5)$ or $1.25 \times 12(=15)$ for a complete process, eg $(10 - 8) \times \text{overtime rate} + 12 \times 8$ or $12 \times 10 + "0.5" \times 12$ cao
10		1 : 10	M1 A1	for $12 : (20 \times 6)$ oe or $10 : 1$ or 1 with 10 in incorrect notation cao



Paper 1MA1: 1F				
Question	Working	Answer	Mark	Notes
13		343	P1 P1 P1 A1	for finding area of one face eg $294 \div 6 (= 49)$ for $\sqrt[3]{49}$ ($=7$) for “49” $\times$ “7” or for “7” $\times$ “7” $\times$ “7” oe cao
14		$\frac{5}{7}$ supported	P1 P1 C1	for $\frac{7}{5} = 1.4$ or $\frac{5}{7} = 0.7$.. or compares $\frac{1}{7}$ to $\frac{1}{5}$ or compare $\frac{5}{7}$ to 1 eg $1 - \frac{5}{7} (= \frac{2}{7})$ or compare $\frac{7}{5}$ to 1 eg $\frac{7}{5} = 1\frac{2}{5}$ or eg $\frac{49}{35}$ or $\frac{14}{35}$ or $\frac{25}{35}$ oe for $\frac{7}{5} = 1.4$ and $\frac{5}{7} = 0.7$.. or compares $\frac{5}{7}$ to 1 eg $1 - \frac{5}{7} (= \frac{2}{7})$ and $\frac{7}{5}$ to 1 eg $\frac{7}{5} = 1\frac{2}{5}$ or two correct fractions with common denominator eg $\frac{49}{35}$ and $\frac{25}{35}$ for $\frac{5}{7}$ with supporting evidence
15		45	M1 A1	for a correct first step eg $\frac{9}{7+4+9} (= \frac{9}{20})$ or $\frac{100}{7+4+9} (=5)$ or a full method for one of the other colours cao



Paper 1MA1: 1F				
Question	Working	Answer	Mark	Notes
16 (a)		Explanation	C1	eg States over-estimated for both values
(b)		182.7(0)	P1	for a process to find 10% of a value stated in the question eg $\frac{10}{100} \times 5.80 (=0.58)$ or $\frac{10}{100} \times 35 (=3.5)$ oe or $35 \times 5.80 (=203)$, allow $30 \times 5.80 (=174)$ or $35 \times [\text{reduced price}]$
			P1	for a process to find 90% of a value stated in the question eg $35 - "3.5" (=31.5)$ or $0.9 \times 5.80 (=5.22)$ oe or $\frac{10}{100} \times "203" (=20.3)$ or $\frac{10}{100} \times "174" (=17.4)$ oe
			P1	for a complete process to find actual cost of 35 eg $0.9 \times 5.80 \times 35$ oe
			A1	cao
				SC B2 156.6(0)
17		$\frac{4}{9}$	M1	for listed outcomes (allow 1 error eg omission or repeat) or fractions $\frac{1}{3} \times \frac{2}{3} + \frac{2}{3} \times \frac{1}{3}$
			A1	for $\frac{4}{9}$ oe
18		135	M1	for $450 \div "2+3+5" (=45)$ or $\frac{3}{10} \times 450 (=135)$ or 5 parts are 225 or 2 parts are 90 indicated
			A1	Cao



Paper: 1MA1/2F				
Question	Working	Answer	Mark	Notes
5 (a)		$\frac{33}{60}$	M1	for method to find number of students who did not walk to school eg $15 + 12 + 6$ or $60 - 27 (=33)$ or 0.55 or for $1 - \frac{27}{60}$
			A1	for $\frac{33}{60}$ or equivalent fraction
(b)		Pie chart drawn	M1	for method to find the angle for at least one sector eg $\frac{27}{60} \times 360$, $\frac{12}{60} \times 360$, $\frac{6}{60} \times 360$, $27 \div \frac{60}{360}$, $12 \div \frac{60}{360}$, $6 \div \frac{60}{360}$ oe (0.166..) NB: could be implied by one angle drawn accurately.
			M1	for drawing at least one sector accurately (from 4 sectors) eg 162° or 72° or 36°
			A1	for an accurately drawn pie chart
			B1	(dep on 4 sectors with at least one accurately drawn) for showing labels Walk Car Bicycle
6 (a)		$\frac{3}{7}$	B1	for $\frac{3}{7}$ or equivalent fraction
(b)		3 : 1	B1	for 3 : 1 or equivalent ratio



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
15	24	M1 A1	for method to find 15% of 160, eg $160 \times \frac{15}{100}$ oe (= 24) or $10\% = 160 \div 10 (= 16)$ plus $5\% = "16" \div 2 (= 8)$ (= 24) cao SC B1 for answer of 136 or 184 if M0 scored	When using partitioning methods, the method to find individual %s must be clear including the need to show an intention to sum eg. $10\% = 16 + 5\% = 8$
16 (a)	14	M1 A1	for 4×5 and 3×-2 , the substitution may be seen in two separate calculations, eg $4 \times 5 (= 20)$ and $3 \times -2 (= -6)$ cao	
(b)	$4e^2 + 8e$	B2 (B1)	for $4e^2 + 8e$ for $4e^2$ or $8e$	Note: $4e^2 + 8e = 12e^3$ for example gets B1 only
(c)	11	M1 A1	for a correct first step eg $3 \times m - 3 \times 4 = 21$ or $m - 4 = 21 \div 3 (= 7)$ oe cao	Showing $\div 3$ by each side of equation is sufficient
17	1 : 3	M1 A1	for $\frac{1}{4} : \frac{3}{4}$ oe OR for any correct un-simplified ratio, eg 25 : 75 cao SC: B1 for an answer of 3 : 1 or $1 : \frac{1}{3}$ if M0 scored	Ignore 'units' such as 1 nuts : 3 no nuts $1 : 3n$ gets M1A0



Paper: IMA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)	10	B1	cao	
	30	M1	for using the graph to take one correct reading	May be shown on graph
		A1	30 or ft from correct use of graph	
13	4 : 1 : 2	M1	for start to express the statements as a ratio eg 4 : 1, 1 : 4, 1 : 2 or 2 : 1 with clear and correct link to Azmol, Ryan, Kim	Allow any equivalent ratio, integers only May be seen as part of an incorrect answer. May be seen as integer multiples of these algebraic expressions. Any letter may be used. Accept 8 : 2 : 4 or equivalent ratios involving integers
		A1	4 : 1 : 2 oe	
		(SCB1	3 integer numbers in correct ratio but no ratio notation, eg 4, 1, 2 or 20, 5, 10)	
14	shown	M1	for method to find angle ADC , eg $180 - 75 (= 105)$	Must be clear link to angle ADC , may be marked on diagram
		M1	for angle $BCD = 50$	
		M1	for method to find angle ABC , eg $360 - 100 - 50 = "105"$	Must be clear method/explanation shown. Angle marked on diagram is not sufficient. Underlined words need to be shown; reasons need to be linked to their method
		C1	(dep M3) for angles ADC , BCD and ABC correct and at least 2 appropriate reasons, eg vertically <u>opposite angles</u> are equal or <u>vertically opposite angles</u> are equal, <u>angles</u> on a straight <u>line</u> add to <u>180°</u> , <u>angles</u> in a <u>quadrilateral/kite</u> add up to <u>360°</u> ; <u>angles</u> at a <u>point</u> add up to <u>360°</u>	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
15	6	P1 P1 A1	for listing the multiples of 3 and 5 to at least the number 15 or $3 \times 5 (= 15)$ for considering multiples of 15, eg 4 multiples of 15 identified or $100 \div 15 (=6.6..)$ or an answer of 7 cao	3, 6, 9, 12, 15 and 5, 10, 15 If in a list of multiples of 3 and 5, multiples of 15 must be clearly identified Sight of 6.6(...) or $6\frac{2}{3}$ oe or an answer of 7 gets 2 marks.
16	30:1	M1 A1	for stating $450 : 15$ oe or $450 \div 15 (=30)$ oe or $1 : 30$ cao	$90 : 3$ Ignore units throughout.
17 (a)	Full working seen	M1 M1 C1	for an initial step with the expressions eg doubling $2x + 1$ or $x + 2$ or halving $4x$ or for identifying CD as $x + 2$ or for identifying DE as $2x + 1$ for an expression for the total perimeter, eg $4x + 2 \times (2x + 1) + 2 \times (x + 2)$ for full simplification and equating to 18	May be seen in working or on diagram
(b)	1.2	M1 A1	for isolating terms in x can fit an equation stated in (a) provided in form $ax + b = c$ for 1.2 oe	$10x = 18 - 6$ Accept $\frac{12}{10}$ or $\frac{6}{5}$



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
12	$\frac{9}{25}$	M1 A1	for $\frac{n}{6+9+10}$ where n is an integer < 25 for $\frac{9}{25}$	Or equivalent fraction
13 (a)	example	C1	example given eg 40, 80, etc.	No can be implied from their statement
(b)	No with reason	C1	for No with reason Acceptable examples 80 and 88 are both in the sequence 80 is in the sequence and 85 is 5 more 24, 32, ... 80, 88, ... 85 is not in the 8 times table 85 is an odd number $8n+16=85$ so n is not a whole number. Not acceptable examples adding 8 each time will not lead to 85 (insufficient) it goes past 85 Yes	
14	2.4774(011...)	M1 A1	for 8.77 or 3.54 or 2.477 or 2.47 or 2.48 or $\frac{877}{354}$ for 2.4774(011...)	If the answer has been rounded to less than 4 dp but the figure is shown in working to 4 dp or more, award full marks. Ignore any incorrect digits after the 4 th decimal place.



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
19	$\frac{3}{10}$	P1 A1	for a process to find three amounts in the correct proportions, eg $R = 1$, $L = 3 \times 1 = 3$, $A = 2 \times 3 = 6$, or $R : L : A = \frac{1}{6} : 0.5 : 1$ oe or $L=3R$, $L=\frac{A}{2}$ or $L=3R$, $2L=A$ for $\frac{3}{10}$ or equivalent fraction	Relationship could be given in algebraic form or in ratio form, using fractional comparison or using their own figures Award P1 for correct answer not given as a fraction
20	1.75	P1 P1 P1 A1	for an initial process eg $1.80 \div 12 (=0.15)$ or $1.80 \div 3 (=0.6)$ for a correct second step eg " 0.15 " $\div 3 (=0.05)$ or " 0.6 " $\times 7 (=4.2)$ or $3 \div "0.15"(=20)$ or $7 \div 3 (=2.3..)$ or " 0.15 " $\times 7 (=1.05)$ for finding the price of one pen eg " 0.05 " $\times 7 (=0.35)$ or " 4.2 " $\div 12 (=0.35)$ or $7 \div "20"(=0.35)$ or " $2.3....$ " $\times "0.15" (=0.35)$ or " 1.05 " $\div 3 (=0.35)$ cao	Accept $1.8 \div 12 = 15$ (p) They can work in pounds or pence
21 (a)	$2 \times 2 \times 3 \times 7$	M1 A1	for a complete method to find prime factors, could be shown on a factor tree, with no more than one arithmetic error or for 2, 2, 3, 7 for $2 \times 2 \times 3 \times 7$ oe	Condone the use of 1 Accept $2^2 \times 3 \times 7$
(b)	420	M1 A1	for at least 3 multiples of both 60 and 84 (can include 60 and 84) or finds the prime factors of both 84 (may be seen in (a)) and 60, may be seen in factor trees 420 or $2 \times 2 \times 3 \times 5 \times 7$ oe	60, 120, 180, 240, 300, 360, 420 84, 168, 252, 336, 420 $60 = 2 \times 2 \times 3 \times 5$ or $2^2 \times 3 \times 5$ If factor tree in (a) is incorrect fit this factor tree in part (b) for M1 only

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
15	175	M1 A1	for a complete method eg $35 \times (4 + 1)$ oe cao	
16	Rotation of 90° , centre (0,0)	B2 (B1	Rotation of 90 about (0,0) or Rotation of 270, clockwise about centre (0,0) Rotation and 90 or Rotation and 270, clockwise or Rotation about (0,0))	Accept “origin” or “O” for (0,0)
17	Drawing	B1 B1	for drawing point <i>R</i> from <i>T</i> at a distance of 5.5 cm. for drawing point <i>R</i> from <i>T</i> on a bearing of 65°	Unless ambiguous point <i>R</i> can be indicated by a cross, dot, or interpreted as the end of a line drawn from <i>T</i> .
18	4	M1 M1 A1	for a correct first step eg shows $4 \times 2x - 4 \times 3$ or $8x - 12$ or $2x - 3 = \frac{20}{4}$ for isolating terms in <i>x</i> eg $2x = 5 + 3$ cao	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	Shown	M1	for a method to find the total cost for footballs, hockey sticks or cricket bats, eg $9.5 \times 5 (= 47.5)$ or $(6 \div 2) \times 30 (= 90)$ or $23 \times 2 (= 46)$ OR begins to work with budget, eg $200 - 5 (= 195)$	Can be done with addition or subtraction, or combination
		M1	for a method to find the total cost for two of footballs, hockey sticks or cricket bats, eg two from $9.5 \times 5 (= 47.5)$ or $(6 \div 2) \times 30 (= 90)$ or $23 \times 2 (= 46)$ OR works with budget and total cost for one of footballs, hockey sticks or cricket bats, eg $200 - "47.5"$	
		M1	for a complete method to find comparable figures, eg $9.5 \times 5 + (6 \div 2) \times 30 + 23 \times 2 + 5$ or $"47.5" + "90" + "46" + 5$ or $200 - (9.5 \times 5 + (6 \div 2) \times 30 + 23 \times 2 + 5)$ or $200 - "188.5"$	
		C1	shows correct figures for a conclusion eg (£)188.5(0) or (£)11.5(0)	
9	WP WS WC BP BS BC GP GS GC	B2	for all correct and no incorrect or repeats	Ignore repeats
		(B1	for at least 4 correct)	
10	3 : 5	M1	for 24 : 40 or for any ratio equivalent to 24 : 40 or 5 : 3	Accept 3 : 5 in the form $n : 1$, eg 0.6 : 1 or 1 : n , eg 1 : 1.66(..)
		A1	for 3 : 5	
11 (a)	Unlikely	B1	cao	
(b)	Evens	B1	cao	
12	111	M1	for a complete method, eg 37×3 oe	
		A1	cao	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
9	5	P1	for process to work in consistent units, eg $12 \times 1000 (= 12000)$ or $105 \div 1000 (= 0.105)$	May be seen in subsequent calculations
		P1	for process to work with portion size, eg $105 \times 3 (= 315)$ OR $12 \div [0.105] (= 114.285...)$	For [0.105] allow use of 0.105, 1.05 or 10.5
		P1	for process to work with weight of food per week or number of days, eg $"315" \times 7 (= 2205)$ or $"315" \times 5 (= 1575)$ or $"315" \times 6 (= 1890)$ [12000] $\div$ "315" (=38(.095...)) OR $[114.285...] \div 3 (= 38(.095...))$ or $[114.285...] \div 7 (= 16.3...)$	For [12000] accept use of 12000, 1200 or 120 For [114.285] allow continued use of incorrectly converted figure from previous mark.
		P1	(dep P2) for process to find number of weeks, eg $"12000" \div "2205" (= 5.4...)$ OR $"38.095..." \div 7 (= 5.4...)$ OR $"16.3..." \div 3 (= 5.4...)$ OR $"2205" \times 5 (= 11025)$ or $"2205" \times 6 (= 13230)$ OR 975 or -1230	
		A1	cao	If a correct answer is given without supportive working award 0 marks.
10 (a)	Pentagon	B1	cao	
(b)	112.5	P1	for process to find total length using their edges eg 15×7.5 or [edges] $\times 7.5$	[edges] must be unambiguously identified
		A1	for 112.5 oe	
11	$\frac{7}{25}$	M1	for $\frac{n}{2+16+7}$ where n is an integer < 25	
		A1	cao	

Paper: 1MA1/1F					
Question		Answer	Mark	Mark scheme	Additional guidance
9	(a)	16	B1	cao	
	(b)	19	M1	starts method to find input using inverse operations eg $28 + 10 (=38)$ or sight of $+10$ and $\div 2$	$+10$ and $\div 2$ could be seen in a flow diagram Working may be next to number machine.
			A1	cao	
	(c)	Shown	M1	for carrying out at least one trial or for forming a suitable equation, eg $2x - 10 = x$ or for identifying 10	Trial can be for any value, must be correctly evaluated. Accept correct inverse function trial, correctly evaluated. If working seen on the number machine provided in the question allow for a trial other than input 13 or output 28.
			C1	for showing that an input of 10 gives an output of 10	Allow $10 \times 2 = 20 - 10 = 10$ for M1C1
10		2 : 3	M1	for 24 : 36 oe or 3 : 2 or 1.5 : 1	
			A1	2 : 3 or 1 : 1.5	Do not ISW from 2:3
11	(a)	3	B1	cao	
	(b)	32	B1	cao	
	(c)	$30 \div (3 + 2) - 4$	B1	for brackets correctly placed	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
8 (a)	No and reason	C1	No and reason Acceptable examples No, because $10^2 = 100$ or 10^2 is 10×10 $4^2 = 16$ and $5^2 = 25$ so 20 is not a square number Junaid is wrong because $\sqrt{20} \neq 10$ or $\sqrt{20} = 4.47...$ Incorrect because 20 is 2×10 not 10×10 No she multiplied by 2 instead of squaring or 10^2 is not 10×2 Wrong as she added instead of multiplying Not acceptable examples Yes.... No because 20 is 10×2 Incorrect because 20 is not a square number No because 10^2 is not 20 No because she added No because a square number is when a number is multiplied by itself	
(b)	example	C1	for a correctly evaluated example, eg $12 \div 4 = 3$ or $10 \div 2 = 5$ or $2 \div 4 = 0.5$	Accept rounded and truncated values, eg $2 \div 6 = 0.3(..)$, $100 \div 6 = 16.6(..)$
9	3 : 5	M1 A1	for 90 : 150 oe ratio or 5 : 3 cao	eg 30 : 50, 15: 25, 9 : 15 Accept 3 : 5 in the form $n : 1$, eg 0.6 : 1 or 1 : n , eg 1 : 1.66(...)

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
8 (b)	9	M1	for beginning to work with range, eg $14 - 5$ or $5 - 14$ or 5 to 14 or an answer of -9	Condone eg $5, 14$ but not $5 + 14$
		A1	cao	
9 (i)	65	M1	for a complete method eg $180 - 85 - 30$ or $360 - 180 - 85 - 30$	May be seen on the diagram $85 + 30 + 65 = 180$ scores M1A0 unless 65 clearly identified
(ii)	Reason	A1	cao	
		C1	for <u>Angles</u> on a straight <u>line</u> add up to 180 or <u>Angles</u> at a <u>point</u> add up to 360	Reason must be for their chosen method If M0 awarded in (i) answer must be in the range 35 to 95 to award C1 Underlined words must be seen Condone use of $\angle$ s for angles
10	1 : 4	M1	for $20 : 80$ oe ratio or $4 : 1$	eg $10 : 40, 5 : 20, 2 : 8, 20\% : 80\%$ or $0.2 : 0.8$ oe
		A1	1 : 4	Condone $1\% : 4\%$ but not $0.01 : 0.04$ Accept $0.25 : 1$ or $\frac{1}{4} : 1$

Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
1 (a)		Don, Mersey, Trent, Thames, Severn	B1	accept 112, 113, 297, 346, 354
(b)		Shown	C1	shown with correct values eg $(112 \times 3 =) 336$ (and 346) or $112 + 112 + 112 + 10 = 346$ or $346 \div 3 = 115(.3..)$ (and 112) or $346 \div 112 = 3.089..$ oe
2		$12p + 18b$	M1 A1	$12p$ or $18b$ or $p + b$ $12p + 18b$
3 (i)		15	B1	cao
(ii)		196	B1	cao
4		40	M1 A1	for $32 \div 4 (= 8)$ or $32 \times 5 (= 160)$ or complete method eg $32 \div 4 \times 5$ oe $(= 40)$ cao
5 (a)		1 : 3	B1	oe
(b)		42	M1 A1	ft $56 \div 4 (= 14)$ or complete method to find number of grey tiles eg $56 - (56 \div 4)$, $56 \div 4 \times 3$ oe $(= 42)$ for 42 or ft



Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
10		75	P1 P1 A1	for $90 \div 6 (= 15)$ or for connecting AB and BC by ratio or proportion eg 5 and 1 on the diagram for a complete method to find the length AB eg $90 \div 6 \times 5 (= 75)$ cao
11 (a)		11	M1 A1	substitutes $v = 2$ eg $4 \times 2 + 3$ or $8 + 3$ cao
(b)		$v = \frac{T - 3}{4}$	M1 A1	correct first step to rearrange by isolating $4v$ or dividing each term by 4, eg $T - 3 = 4v$ fully correct answer
12 (a)		Yes (supported)	M1 C1	method to find volume of one cube, eg $2 \times 2 \times 2$ or $2^3 (= 8)$ or draws a solid of 6 cubes Yes with supporting evidence eg $2 \times 2 \times 2 = 8$, $8 \times 6 = 48$
(b) (i)		cuboid drawn	B1	either a 1 by 6 by 1 cuboid (2 cm by 12 cm by 2 cm) or a 2 by 3 by 1 cuboid (4 cm by 6 cm by 2 cm) drawn
(ii)		104 or 88	M1 A1	ft for finding areas of 3 or more faces of their cuboid and adding for 104 or 88

Paper: 1MA1/2F				
Question	Working	Answer	Mark	Notes
11		5 : 2 : 10	P1 P1 A1	for process to calculate total for quiz or total of membership fees eg. $13 \times 5 + 35$ (=100), 25×20 (=500) for complete process to write (correct) figures as a ratio, eg 250 : 100 : 500 oe in any order (condone inclusion of units or words) cao
12 (a)		23, 177 10, 13, 85, 92	C3 (C2 (C1	Completes all information correctly. 3 or 4 correct frequencies or all correct probabilities) 2 correct frequencies)
(b)		$\frac{13}{23}$	M1 A1	ft oe for $\frac{a}{23}$, $a < 23$ or $\frac{13}{b}$, $b > 13$ ft oe from (a)



Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
14		Reflection	B1	for reflection
		in the x-axis (or $y = 0$)	B1	for x-axis (or $y = 0$) NB: award no marks if more than one transformation is given
15		(£6), 18, 24, 27	M1	demonstrates a proportional method to find at least one cost for cotton, eg. $£6 \div 2 \times 9$ (= (£)27) or a correct entry in the table.
		15, 45, 60, 67.50	M1	demonstrates a proportional method to find at least one cost for silk, eg. $£6 \div 2 \times 5$ (= (£)15) or a correct entry in the table.
			A1	for a fully correct table (accept 67.5(0))

Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
20		New York (supported)	P1	for changing between £ and \$, eg $1.089 \times 1.46 (= 1.58(9.))$ or $2.83 \div 1.46 (= 1.93(8.))$ or between litres and gallons, eg $1.089 \times 3.785 (= 4.12(1.))$ or $2.83 \div 3.785 (= 0.74(7.))$
			P1	for a complete process to give values that can be used for comparison, eg “ $1.938... \div 3.785 (= 0.51(2.))$ ” or “ $1.589... \times 3.785 (= 6.01(7.))$ ” or $1.089 \times 3.785 (= 4.12(1.))$ and $2.83 \div 1.46 (= 1.93(8.))$
			C1	for New York and correct comparative values.
21		648	M2	a complete method, eg $12.5 \times 1000 \div 19.3$
			[M1]	for using volume = mass/density, eg $12500 \div 19.3$ (condone inconsistent units or incorrect conversions) may be implied by digits 647... or 648...]
			A1	for answer in range 647 to 648
22		15	P1	strategy to start the problem, eg 8:20 and 20:5
			P1	process to solve the problem, eg $\frac{5}{33} \times 100$ or 24:60:15
			A1	cao
23 (a)		0.625	B1	cao
			B2	$9.75 \leq x < 9.85$
			[B1]	for 9.75 or 9.85 (or 9.849)]
23 (b)		$9.75 \leq x < 9.85$	B1	cao
			B2	$9.75 \leq x < 9.85$
			[B1]	for 9.75 or 9.85 (or 9.849)]



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
20	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 $80 : 50$ If 140 clearly identified as houses in working award full marks
		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	
21	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 [number of bags] can only come from $5 \times 10 \div 250 (= 0.2)$ or $5 \times 100 \div 250 (= 2)$ or $5 \div 250 (= 0.02)$ 3/10 or 0.3 is not enough but should be awarded 2 marks Award P3 for 130(%)
		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 $10 \div 5 (= 2)$	
		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	
		A1	cao	



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
9 (a)	$\frac{3}{7}$	B1	oe	
(b)	1 : 2.5	M1 A1	for appropriate method shown eg $30 \div 12 (=2.5)$ or for a method that involves simplification of 12 : 30 approaching 1 : n , eg. 4 : 10 or 6 : 15 or 2 : 5 or for 2.5 : 1 or $2\frac{1}{2}$: 1 for 1 : 2.5 or 1 : $2\frac{1}{2}$ or for $n = 2.5$	Accept a fraction equivalent to $2\frac{1}{2}$, eg. $1 : \frac{30}{12}$ 2.5 alone gets M1A0
10	660	P1 P1 P1 A1	for a process to work out the number of large marbles eg $12 \div 4 (=3)$ or the number of small marbles eg $12 - [\text{number of large marbles}]$ or $12 \times (1 - \frac{1}{4}) (=9)$ (dep) for a process to work out the weight of large marbles eg $"3" \times 70 (=210)$ or to work out the weight of small marbles eg $"9" \times 50 (=450)$ for a complete process eg $(12 \div 4) \times 70 + 12 \times (1 - \frac{1}{4}) \times 50$ oe cao	[number of large marbles] could come from an incorrect method for finding $\frac{1}{4}$ of 12
11	Reflection	M1 A1	for a correct reflection of the shape in any line or a correct reflection of at least 3 vertices cao	Allow hand-drawn



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
14	Completed table	M1	for correctly entering two of 11, 2, 5, 10 ($= 30 - 20$)	4 2 4 10 1 8 11 20 5 10 15 30
		M1	(indep) for using the rule for the top row eg. $([10 \text{ males}] - [2 \text{ male tennis}]) \div 2 (=4)$	Award 2 nd M1 if top row is correct
		A1	for complete correct table	
15	7	P1	for $750 \times 9 (=6750)$ or $1 + 9 (=10)$ or $750 \div 1000 (= 0.75)$	
		P1	(dep) for “6750” + 750 ($=7500$) or for “10” $\times 750 (=7500)$ or “0.75” $\times$ “1 + 9” ($= 7.5$)	
		A1	cao	
			Alternative	
		P1	for $100 + 900 (= 1000)$	
		P1	(dep) for $750 \div 100 (= 7.5)$	
		A1	cao	This can be implied by (1 litre of drink $\Rightarrow$) 100 (ml) of squash and 900 (ml) of water



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
29	6 : 15 : 20	P1 P1 A1	chooses a multiplier to equate the two fractions in terms of b eg $\frac{2}{5} \times \frac{3}{3} (= \frac{6}{15})$ or $\frac{3}{4} \times \frac{5}{5} (= \frac{15}{20})$ or lists equivalent fractions to $\frac{2}{5}$ up to at least $\frac{6}{15}$, eg. $\frac{2}{5}, \frac{4}{10}, \frac{6}{15}, \dots$ or lists equivalent fractions to $\frac{3}{4}$ up to at least $\frac{15}{20}$, eg. $\frac{3}{4}, \frac{6}{8}, \frac{9}{12}, \frac{12}{16}, \frac{15}{20}, \dots$ or ($a : b =$) 2 : 5 and ($b : c =$) 3 : 4 or for 6 : 15 or 15 : 20 seen P1 puts into related terms ready for ratio eg $\frac{2}{5} \times \frac{3}{3} = \frac{6}{15}$ and $\frac{3}{4} \times \frac{5}{5} = \frac{15}{20}$ or for ($a : b =$) 6 : 15 and ($b : c =$) 15 : 20 or lists equivalent ratios up to a common element for b, eg $a : b = 2 : 5, 4 : 10, 6 : 15$ and $b : c = 3 : 4, 6 : 8, 9 : 12, 12 : 16, 15 : 20$ A1 for 6 : 15 : 20 oe	Need not be written in ratio form Accept equivalent ratios Accept $a = 6, b = 15$ and $c = 20$
30 (a)	$q = \frac{p-7}{6}$	M1 A1	for a correct first step, showing a method of subtraction of 7 from both sides or division of all terms by 6 eg $p - 7 = 6q + 7 - 7$ or $\frac{p}{6} = \frac{6q}{6} + \frac{7}{6}$ oe A1 for $q = \frac{p-7}{6}$ or $q = \frac{p}{6} - \frac{7}{6}$	Allow $1\frac{1}{6}$ for $\frac{7}{6}$ Award for answer without “$q =$”
(b)	m^6	B1	cao	



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
12	Yes, supported by correct working	P1	for 36 : 48 oe OR $\frac{36}{84}$ oe or $\frac{48}{84}$ oe	Relating to drama group 1
		P1	for $\frac{4}{7}$ or 3 : 4 oe (for group 2) OR $(\frac{36}{84} = \frac{3}{7})$ or $(\frac{48}{84} = \frac{4}{7})$ or $84 \times 3 \div 7 (= 36 \text{ boys})$ or $84 \times 4 \div 7 (= 48 \text{ girls})$ or $N \times 3 \div 7$ and $N \times 4 \div 7$	Relating to drama group 2 N can be any number (other than 84) of students in the 2 nd group
		A1	for Yes with both ratios 3 : 4 oe or for a correct pair of fractions and stating they are equivalent.	Both equivalent forms of the ratios (fractions) must be the same "Yes" may be implied from working
13 (a)	Explanation	C1	for explanation Acceptable examples the sequence is going +1, +2 so the next term is +3 $1 + 1 = 2$, $2 + 2 = 4$, $4 + 3 = 7$ add the current term position to the term to get the next term add the two previous terms and add 1 Not acceptable examples you add 1 each time the number goes up by 3 7 is wrong it should be 8 because you double each time	The pattern may be just seen on the sequence given
(b)	36	M1 A1	for finding the next term of $10 + 5 (=15)$ or for $\frac{1}{2} \times 8 \times (8 + 1)$ oe cao	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
23	Rahim (supported)	P1 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 $160000 + "48000"$ (= 208000) OR $220000 \times "0.8"$ (=176000) or $160000 \times "1.3"$ (=208000) 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.
24	33	P1 P1 A1	for relating 24 to 8 parts, or (1 part =) $24 \div 8$ (= 3) or $15 - 7$ (= 8) or starts to use a build-up method, eg (8 :) 14 : 30 P1 for $(15 - 4)$ and $(24 \div 8)$ or 15×3 (= 45) and 4×3 (= 12) or for 12 (: 21) : 45 A1 cao	8 parts = 24

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	168	P1	for a start to the process, eg $\frac{57}{100} \times 800 (= 456)$ or $57 \div (12 + 7) (= 3)$ or $800 \div (12 + 7) (= 42.1...)$ or $[\text{amount}] \times \frac{57}{100}$ or $[\text{amount}] \times \frac{7}{12 + 7}$	May be seen as part of other calculations, eg $\frac{7}{12 + 7} \times 57 (= 21)$ or $\frac{7}{12 + 7} \times 800 (= 294.7...)$ [amount] can be any figure considered as being 57% of 800 or 43% calculated incorrectly or a figure calculated from using full or partial ratio incorrectly as a first step
		P1	for a complete process to find the weight of glass, eg $\frac{57}{100} \times 800 \times \frac{7}{12 + 7}$ oe	
		A1	for an answer in the range 167.9 to 168	
			SCB2 for an answer of 288	
26	12.65, 12.75	B1	for 12.65 in correct position	Accept 12.749 or 12.7499(...)
		B1	for 12.75 in correct position	



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
17	No, with correct figures	P1	for start to process to find amount of each paint colour needed eg $24 \div (4 + 3 + 1) (= 3)$ or $8 : 6 : 2$ or for start to process to simplify $12 : 7 : 5$ to a ratio that can be compared to $4 : 3 : 1$ eg $12 \div 4 (= 3)$ or $7 \div 3 (= 2.3 \dots)$ or $5 \div 1 (= 5)$	
		P1	for complete process to find amount of each paint colour needed eg " 3 " $\times 4 (= 12)$ and " 3 " $\times 3 (= 9)$ and " 3 " $\times 1 (= 3)$ or $12 : 9 : 3$ or for complete process to cancel $12 : 7 : 5$ to a ratio that can be compared to $4 : 3 : 1$ eg $12 : 7 : 5$ as $4 : \frac{7}{3} : \frac{5}{3}$ or $4 : "2.3 \dots" : "1.6 \dots"$ or $12 : 7 : 5$ as $"5\frac{1}{7}" : 3 : "2\frac{1}{7}"$ or $"5.14 \dots" : 3 : "2.14 \dots"$ or $12 : 7 : 5$ as $"2\frac{2}{5}" : "1\frac{2}{5}" : 1$ or $"2.4" : "1.4" : 1$	
		C1	No, with correct figure(s) for comparison. eg No with $12 : 9 : 3$ No, 9 litres of yellow needed No with $4 : 2.3 \dots : 1.6 \dots$	No may be indicated by eg 'not enough yellow'.
18	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	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
20 (b)	150	M1	for at least 3 multiples of both 30 and 25 (can include 30 and 25) or for the prime factors 2, 3, 5 and 5, 5 (could be shown in a factor tree with no more than 1 arithmetic error or Venn diagram or table) or identifies the factors 5, 5 and 6 (may be seen in a grid) or for a different common multiple, eg 300	30, 60, 90, 120, 150, 180, 210, 240 25, 50, 75, 100, 125, 150, 175 $30 = 2 \times 3 \times 5$ $25 = 5 \times 5$ Condone the inclusion of 1s for this mark
		A1	150 or $2 \times 3 \times 5 \times 5$ oe	
21	1380 2070 3450	M1	for beginning to work with ratio, eg $6900 \div (2 + 3 + 5) (= 690)$ or $6900 \div 2 (= 3450)$ or $6900 \div 5 (= 1380)$ or one accurate value correctly assigned	Award M0 for a correct value assigned to an incorrect person
		M1	for full method to find the value for two people, eg two of : $"690" \times 2 (= 1380)$ or $"690" \times 3 (= 2070)$ or $"690" \times 5 (= 3450)$ or $(6900 - "3450") \div 5 \times 2 (= 1380)$ or $(6900 - "3450") \div 5 \times 3 (= 2070)$ or $(6900 - "1380") \div 8 \times 3 (= 2070)$ or $(6900 - "1380") \div 8 \times 5 (= 3450)$ or $6900 \div 2 (= 3450)$ and $6900 \div 5 (= 1380)$	Award M0 for a correct value assigned to an incorrect person
		A1	for Sid (£) 1380 Tam (£) 2070 Musa (£) 3450 If M1M0, award SCB2 for Sid (£) 3450 Tam (£) 2070 Musa (£) 1380	Correct values not assigned or assigned to an incorrect person, coming from an incorrect method, eg (Sid $\Rightarrow$) $6900 \div 2 = 3450$ and (Tam $\Rightarrow$) $6900 \div 3 = 2300$ and (Musa $\Rightarrow$) $6900 \div 5 = 1380$ will score no marks



Paper 1MA1: 1F				
Question	Working	Answer	Mark	Notes
22 (a)	$\frac{8}{20} + \frac{5}{20}$	$\frac{13}{20}$	M1	for suitable common denominator with one fraction out of two correct or 0.4 + 0.25
			A1	for $\frac{13}{20}$ or 0.65 oe
(b)		$\frac{1}{8}$	B1	Accept 0.125
23		$2 \times 2 \times 3 \times 3$	M1	for complete method to find prime factors; could be shown on a complete factor tree with no more than 1 arithmetic error or 2,2,3,3,(1)
			A1	for $2 \times 2 \times 3 \times 3$ oe
24		14:21:42	P1	for 2 out of 3 expressions in one letter eg from $x, x+7, 2x+14$ or see a set of numbers to show interpretation of the relationships, eg 10, 17, 34
			P1	(dep) for sum of their 3 expressions =77 eg $x + x+7+2x+14 =77$ oe or 2 systematic correct trials including addition
			P1	for a correct process to isolate their term in x or $x=14$
			A1	for ratio 14:21:42 oe



Paper: IMA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	420	P1	starts process, eg $300 \div 5 (= 60)$ or $200 \div 2 (= 100)$ OR builds up ratio to at least 300 ml orange juice with one error	May be seen as $"60" \times 7$ " 60 " must come from correct method
		P1	complete process, eg $"60" \times 5 + "60" \times 2$ or $300 : 120$	
		A1	cao	
		C1	explains that it will have no effect with reason, eg because he only needs 120 ml of lemonade because he has no more orange juice to use	
(b)	explanation	C1	explains that it will have no effect with reason, eg because he only needs 120 ml of lemonade because he has no more orange juice to use	
16	No and explanation	C1	'No' and explanation with reference to multiplication or division eg No he's incorrect as you would multiply the sides by a number rather than add	
17 (a)	32, 48, 24, 8, 37, 11	C1	starts to interpret information, eg 48 or 8 in correct place	Incorrect notation with " 37 " and " 61 " can earn the method mark but not the accuracy mark. Accept any equivalent fraction, decimal form 0.60(65...) or 0.61 or percentage form 60(65...) % or 60% or 61%
		C1	for $80 - 48 (= 32)$ and $"32" - 8 (= 24)$	
		C1	completes frequency tree correctly SC: award C2 if all correct frequencies are shown as fractions of 80.	
		M1	ft for $\frac{a}{"61"}$ with $a < "61"$ or $\frac{"37"}{b}$ with $b > "37"$	
		A1	ft from diagram in (a)	
(b)	$\frac{37}{61}$	M1	ft for $\frac{a}{"61"}$ with $a < "61"$ or $\frac{"37"}{b}$ with $b > "37"$	
		A1	ft from diagram in (a)	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
26	$c = -6$ $d = -1$	M1	for reflection in x-axis shown on diagram	Vertices (3, -2), (5, -2), (3, -5)
		A1	for $c = -6$ or $d = -1$	One correct value is M1A1 regardless of second value or diagram
		A1	for both $c = -6$ and $d = -1$	
			SCB2 for $c = -1$ and $d = -6$	
27	96	P1	for process to find the ratio of the number of pens of each colour sold, eg $2 \times 7 : 5 \times 3 : 6 \times 4$ ($= 14 : 15 : 24$)	Does not have to be seen as a ratio but all three needed
		P1	for process to find the proportion of green pens sold, eg $\frac{212}{"14"+"15"+"24"}$ or $\frac{"24"}{"14"+"15"+"24"}$	
		P1	for a complete process to find the number of green pens sold, eg $\frac{212}{"14"+"15"+"24"} \times "24"$ or $\frac{"24"}{"14"+"15"+"24"} \times 212$	P3 can be implied by the values 56, 60 and 96
		A1	cao	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
24	9.85	M1	for $\sin(38) = \frac{AB}{16}$ oe or alternative method to find AB	
		A1	for an answer in the range 9.76 to 9.92	
25	8.3 and 8.4	B1	for 8.3 in the correct position	Accept 8.39 or 8.399...
		B1	for 8.4 in the correct position	
26	168	P1	for working with ratio to find the amount for C or D eg. $1.5 \times 2 (=3)$ or (A, B, C, D =) 2, 7, 3, 3 oe OR for suitable expressions linking A with C or D, eg. $A = x$, $C = 1.5x$	
		P1	for “2 + 3 + 3 + 7” (=15) OR adds 4 suitable expressions, eg. “ $x + 3.5x + 1.5x + 1.5x$ ” (= 7.5x)	
		P1	for a complete process to find the amount of money eg. $360 \div “15” \times 7$ OR $360 \div “7.5” \times 3.5$	
		A1	cao	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
21	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 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	
22	$2\frac{1}{3}$	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	
23	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: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
23	18	P1	for $240 \div 10$ (= 24) or $240 \div 8$ (= 30)	Accept 3 + 7 for 10, 3 + 5 for 8
		P1	for $3 \times "24"$ (= 72) or $7 \times "24"$ (= 168) or $3 \times "30"$ (= 90) or $5 \times "30"$ (= 150)	
		P1	for $3 \times "24"$ (= 72) and $3 \times "30"$ (= 90) or $7 \times "24"$ (= 168) and $5 \times "30"$ (= 150)	
		A1	cao	
24 (i)	238	P1	for working with proportion eg $\frac{17}{50} \times 700$ oe	
		A1	cao	
(ii)	statement	C1	for statement Acceptable Sample is representative (otherwise answer wrong) Random sample (otherwise answer will be different) The 50 people are from the 700 (otherwise not accurate) 17 out of every 50 want a sports bag (otherwise answer will be different / wrong) There is no bias That the other 650 will want the same gifts as the 50 Not acceptable There would be more than 17 people who want the sports bag I rounded my answer 17 out of 50 want a sports bag A repeat of the calculation done in (i) Most of the people would want a sports bag References as what might change in the future (eg a change in membership) That all 700 people wanted a type of gift rather than no gift (otherwise would have changed my answer)	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
17	7 22 15 38 29 9	C1 M1 M1 M1 A1	for correctly placing one of the given values in the diagram eg 38 women or 15 men email for 60 – 38 (=22) or 22 (men) correctly placed in the diagram or 60 – 38 – 15 (=7) or 7 (men texting) correctly placed in the diagram for a method to find 60% of 60, eg. 60×0.6 (= 36) for calculating with 60% of 60 eg “36” – (“22” – 15) (= 29) or “36” – “7” (=29) or (60 – “36”) – 15 (= 9) for a fully correct frequency diagram	May be implied by the total number of texts in the frequency diagram being 36 9 or 29 on the diagram (women branch) gets the two M marks for finding and calculating with 60% of 60 If probabilities used instead of frequencies then maximum of C1M1M1M1A0 can be awarded
18	13	P1 P1 A1	for at least two of 3×5 (=15) or 2.5×8 (=20) or 1.5×14 (=21) or 1×10 (=10) or for $3 \times 5 + 2.5 \times 8 + 1.5 \times 14 + 1 \times 10$ (=66) for process to find length of all 2m planks, eg. $92 - (3 \times 5 + 2.5 \times 8 + 1.5 \times 14 + 1 \times 10)$ (= 26) or $92 - “15” - “20” - “21” - “10”$ (= 26) cao	Note 66 on its own will score this mark If no calculations are seen for products allow one error in “15”, “20”, “21”, “10” 13 in the correct place in the table should be accepted as the final answer
19	No (supported)	P1 P1 P1 C1	for a process to find Rachel’s share, eg. $600 \div 5 \times 2$ (= 240) for process to find Samina’s share eg. $(600 - “240”) \div 4$ (= 90) for a process to find either of Tom’s share, eg. $600 - “240” - “90”$ (= 270) or $3 \times “90”$ (=270) or $600 \div 3$ (= 200) for comparison purposes for “No” and accurate figures eg. 270 and 200 or 270 and 70 (difference)	Note This mark, if awarded for 200, may be the only mark awarded “No” may be implied by a statement Answer only with no working, no marks



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
13 (a)	40	M1	$2 \div (2+3) \times 100 (=40)$ or build up to (and shows) 40:60 oe	
			or for sight of $\frac{2}{5}$ oe or $100 \div 5 (=20)$	
		A1	cao	
(b)	20 : 80	M1	$100 - 20 (=80)$ or $80 : 20$ oe	
		A1	20 : 80 oe	
14	80	P1	for $1 - \frac{13}{15} \left(= \frac{2}{15} \right)$ or $\frac{13}{15} \times 600$ (million) (= 520 (million))	Condone no million or may see 000 000 used* *In this case condone up to two missing 0s for the award of the P marks. For P marks accept $\frac{13}{15}$, $\frac{2}{15}$ rounded or truncated to no less than 2dp.
		P1	for " $\frac{2}{15}$ " $\times 600$ (million) (= 80 (million)) or $600 - "520"$ (=80) oe	
		A1	Accept 80 000 000	
15	Explanation	C1	for explanation Acceptable examples They do not add to 360 They add to 100 too least It is missing a 100 angle / It needs 100 more Because the total has to be 360 A whole circle is 360 Not acceptable examples They add up to 260 One of the angles is wrong A shape with 4 angles adds up to 360	

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: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
26	21	P1	for process to work correctly with initial ratio, eg $120 \div 4 \times 9 (= 270)$ or $90 + 120 + 60 (= 270)$	Can be implied by $90 : 120 : 60$ or by a second ratio that totals to 270
		P1	for process to find the value of 1 part in the new ratio, eg $"270" \div (2 + 5 + 3) (= 27)$	
		P1	for process to find both values for Errol, eg $("27" \times 3) (= 81)$ and $(120 \div 4 \times 2) (= 60)$	
		A1	cao	
27	327	M1	for $147 + 180$ or for $360 - (180 - 147)$, or for drawing a suitable diagram with 147 in the correct position and with the bearing of A from B indicated	Diagram can be a sketch
		A1	cao	
28	65	P1	for a full process to find the volume of the container, eg $\pi \times 15^2 \times 43 (= 30\,394.9\dots)$	These steps may be completed in a different order Accept 9675π Accept 9.675π or $\frac{387}{40}\pi$ [volume] can be any value they believe to be the volume that might have been incorrectly converted (or not at all) If an answer is given in the range in working and then rounded incorrectly award full marks.
		P1	for a process to convert between cm^3 and litres, eg $"30\,394.9\dots" \div 1000 (= 30.39\dots)$ or [volume] $\div 1000$ or $0.47 \times 1000 (= 470)$	
		P1	for a complete process to find the time taken, eg [volume] $\div 0.47$ or [volume] $\div "470"$	
		A1	answer in the range 64.6 to 65	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	Yes, supported by correct figures	P1	for a process to find the number of sweets Tina gives to Andy, eg $14 \div 7 \times 3 (=6)$ or for a process to work with fractions of the total to find fraction given to Andy, eg $\frac{14}{21} \times \frac{3}{7} (= \frac{2}{7})$ or for dividing a given number (eg 441) in the ratio 1 : 6 : 14 (= 21 : 126 : 294)	May work with an equivalent ratio, eg 21 : 126 : 294 and do $294 \div 7 \times 3 (=126)$ as a first step May work in multiples of x for all marks
		P1	for a process to find number for Andy and Tina after first exchange, eg $A = 1 + "6" (=7)$ and $T = 14 - "6" (=8)$ or for a process to find the number of sweets Tina gives to Luke eg $("14" - "6") \times \frac{12.5}{100} (=1)$ or for a process to work with fractions of the total to find fraction given to Luke, eg for $\frac{(14 - "6")}{21} \times \frac{12.5}{100}$ or process to work out the number of sweets given to Andy and Luke for their total, eg $"294" \div 7 \times 3 (=126)$ and $("294" - "126") \times \frac{12.5}{100} (=21)$	
		P1	for a process to find the final amounts or final shares for at least two of Andy, Luke and Tina eg two of $1 + "6" (=7)$, $6 + "1" (=7)$, $14 - "6" - "1" (=7)$ or $\frac{1}{21} + \frac{"2"}{7} (= \frac{7}{21})$, $\frac{6}{21} + \frac{"1"}{21} (= \frac{7}{21})$, $\frac{14}{21} - \frac{"2"}{7} - \frac{"1"}{21} (= \frac{7}{21})$ or $"21" + "126" (=147)$, $"126" + "21" (=147)$, $"294" - "126" - "21" (=147)$	
		C1	Yes, supported by full working and accurate figures for Andy, Luke and Tina	Accurate figures with no supportive working scores 0



Paper 1MA1: 2F				
Question	Working	Answer	Mark	Notes
18		Yes (supported)	P1	for process to work out the total number of children, e.g. $117 \times 4 (= 468)$
			P1	(dep P1) for process to work out total number of adults or the total number of people, e.g. $"468" \times 5 \div 2 (= 1170)$ or $"468" \times 7 \div 2 (= 1638)$
			A1	for 1170 or 1638
			P1	for process to work out the percentage of theatre full, e.g. $\frac{"468" + "1170"}{2600} \times 100 (= 63)$ or for a process to work out 60% of 2600 ($= 1560$)
			C1	for a correct conclusion supported by correct figures e.g. 63% or 1560 and 1638
			OR	
			P1	for a process to work out 60% of 2600, eg. $\frac{60}{100} \times 2600 (= 1560)$
			P1	(dep P1) for process to work out total number of children, e.g. $"1560" \times 2 \div 7 (= 445(.7...))$
			A1	for 445(.7...)
			P1	for process to work out number of children in the circle, eg. $"445(.7...)" \div 4 (= 111 \text{ to } 112)$
			C1	for a correct conclusion supported by correct figures e.g. 111 to 112 [Where appropriate, accept rounded or truncated values]





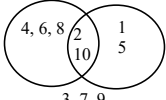
Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
18		68	P1 for a process to find the number of vanilla cakes, eg $420 \times 2 \div 7$ oe (= 120) P1 for a process to find the number of banana cakes, eg 420×0.35 oe (= 147) P1 (dep P1) for a full process to find the number of lemon/chocolate cakes eg $420 - (\text{vanilla cakes}) - (\text{banana cakes})$ (= 153) P1 (dep on previous P1) for a process to find the number of lemon cakes eg "$153 \div 9 \times 4$" oe (= 68) A1 cao OR P1 for writing two proportions in the same format P1 for combining the proportions of vanilla and banana cakes eg $2/7 + 7/20$ (= $89/140$) P1 (dep P1) for a full process to find the proportion or number of lemon/chocolate cakes eg $1 - "89/140"$ (= $51/140$) P1 (dep on previous P1) for a process to find the number of lemon cakes eg "$51/140 \times 420 \div 9 \times 4$" (= 68) A1 cao	
19		Shows polygon is a hexagon	M1 for a complete method to find the interior or exterior angle of the dodecagon eg $180 - \frac{360}{12}, \frac{180}{12} (12 - 2)$ oe (= 150), $360 \div 12$ (=30) M1 for a complete method to find the interior angle of polygon P eg at B or C: $360 - "150" - 90$ (= 120) or "30" + 90 (= 120) or for a complete method to find the interior or exterior angle of the hexagon eg $180 - \frac{360}{6}, \frac{180}{6} (6 - 2)$ oe (= 120), $360 \div 6$ (= 60) A1 for 30 and 120 or 30 and 60 or 120 and 150 or 60 and 150 C1 complete solution, fully supported by accurate figures	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
23	3 : 5	P1 P1 P1 P1 A1	for process to find 20% or 120% of the cost, eg 8500×0.2 (= 1700) oe or 8500×1.2 (= 10 200) oe for process to find total cost of payments, eg 12×531.25 (= 6375) for complete process to find value of deposit, eg “10 200” – “6375” (= 3825) or $8500 - “6375”$ (=2125) and “2125” + “1700” (=3825) OR the deposit as a proportion of the total cost, eg $1 - \frac{6375}{10200}$ ($=\frac{3}{8}$) for finding a correct un-simplified ratio, eg “3825” : “6375” oe or 5:3 or $1\frac{1}{5}$: 1 or $\frac{5}{3}$: 1 Accept 1: $1\frac{1}{5}$, 1: $\frac{5}{3}$	When partitioning all figures quoted must be correct or a full method shown eg $10\% = 8500 \div 10$ (=850) and $20\% = “850” + “850”$ (=1700) May be seen as a fraction of the total eg $\frac{3825}{10200}$ ($=\frac{3}{8}$) Figures at this stage must be expressed as part of a ratio eg 51:85, $\frac{3}{8} : \frac{5}{8}$ Ignore consistent units
24	(a) 0, -4, -6, -4, 0 (b) Graph (c) 2.6 and -1.6	B2 (B1) M1 A1 M1 A1	fully correct figures At least 2 correct figures) (dep B1) for at least 5 points correctly plotted ft from (a) fully correct graph for $y = -2$ drawn or intersections with $y = -2$ or $y = x^2 - x - 4$ drawn or 1 correct value ft a quadratic graph or for answers in the range 2.5 to 2.7 and -1.5 to -1.7	Must be a curve If answers stated as coordinates, award M1 for both coordinates and M0 for one coordinate

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.
(b)	1 : 3	A1	cao	
		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
22 (a)	Venn diagram	M1	for correct numbers in at least one region	Ignore all entries except the region you are marking for each method mark  Need not be written in correct form at this stage eg could be a ratio 2 : 10 Repeated digits in the diagram should be counted as 2 elements Accept any equivalent fraction, decimal form 0.2 or percentage form 20%
		M1	for correct numbers in at least two regions	
		A1	for all regions correct	
	$\frac{2}{10}$	M1	for $\frac{a}{10}$ where $0 < a < 10$ and a is an integer or $\frac{2}{b}$ where $b > 2$ and b is an integer or ft diagram	
		A1	$\frac{2}{10}$ oe or ft diagram	
23	No (supported)	P1	for $3000 \div (2 + 3) (= 600)$	Full method to compare No may be implied by a statement No working, answer only no marks
		P1	for “600” $\times 2 (= 1200)$ or “600” $\times 3 (= 1800)$ or “600” $\div 6 (= 100)$ or “600” $\div 20 (= 30)$	
		P1	for “1200” $\div 6 (= 200)$ or “1800” $\div 20 (= 90)$ or “100” $\times 2 (= 200)$ or “30” $\times 3 (= 90)$	
		P1	for “90” $\div (“200” + “90”) \times 100 (= 31.0\dots)$ oe or “90” $\div (“200” + “90”) (= 0.31\dots)$ or $0.3 \times (“200” + “90”) (= 87)$ oe	
		C1	correct conclusion and fully correct calculations with accurate figure eg No and 87 or No and 31% or No and 0.31	

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: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
18	60	P1	for $240 \div (5 + 3 + 2) (= 24)$	
		P1	for complete process to find the number of cans of each drink eg $5 \times "24" (= 120)$ and $3 \times "24" (= 72)$ and $2 \times "24" (= 48)$	
		P1	for process to find the number of cans removed eg $"72" \div 2 (= 36)$ and $"48" \div 12 (= 4)$	
		P1	for process to find percentage eg $\frac{"120"}{240 - ("36" + "4")} \times 100$ or $\frac{"120"}{"120" + ("72" - "36") + ("48" - "4")} \times 100$	
		A1	cao	
			Alternative	
		P1	for process to find proportion of lemonade and orange cans removed, eg $3 \times \frac{1}{2} (= 1\frac{1}{2})$ and $2 \times \frac{1}{12} (= \frac{1}{6})$	
		P1	for process to find proportion of lemonade and orange cans remaining, eg $3 - "1\frac{1}{2}" + 2 - "\frac{1}{6}" (= 3\frac{1}{3})$	
		P1	for $5 + "3\frac{1}{3}" (= 8\frac{1}{3})$	
		P1	for process to find percentage eg $(5 \div "8\frac{1}{3}") \times 100$	
		A1	cao	



Paper: 1MA1/1F					
Question	Answer	Mark	Mark scheme	Additional guidance	
26	7.5	P1	for process to find the number of empty jars eg $3 \div 8 \times 400$ oe (= 150)		
		P1	for start of process to deal with ratios eg 3 : 4 and 4 : 8 or 3 : 4 : 8 oe		
		P1	for process to find the number of empty small jars eg $\frac{3}{3+4+8} \times "150"$ oe (= 30) or 30 : 40 : 80		
		P1	for process to find percentage, eg $\frac{"30"}{400} \times 100$ oe or $\frac{"7.5"}{100}$		
		A1	for 7.5 or $7\frac{1}{2}$ oe		
		OR			
		P1	for start of process to deal with ratios eg 3 : 4 and 4 : 8 or 3 : 4 : 8 oe		
		P1	for process to find the proportion of the empty jars that are small eg $\frac{3}{3+4+8} (= \frac{1}{5})$		
		P1	for process to find the proportion of Kasim's jars that are empty small jars eg $\frac{3}{8} \times \frac{1}{5} (= \frac{3}{40})$		
		P1	for process to find percentage, eg $\frac{3}{40} \times 100$ oe or $\frac{"7.5"}{100}$		
		A1	for 7.5 or $7\frac{1}{2}$ oe		



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
24 (a)(i)	2 : 6 : 5	P1	for process to compare ratios, eg $a : b = 2 : 6$ or $b : c = 3 : 2.5$	Could use 3 or any common multiple of 3 and 6
		A1	for 2 : 6 : 5 oe	
	$\frac{2}{13}$	M1	for process to find fraction, eg $\frac{[2]}{[2+6+5]}$ or for $\frac{a}{a+b+c}$	
		A1	for $\frac{2}{13}$ oe or ft (a)(i)	
	1 : 10	P1	for process to express all numbers in terms of one number, eg $p = 5 \times 2m (= 10m)$ or $m = \frac{n}{2}$ or for $2m = \frac{p}{5}$ or for assigning values in the ratio given, eg $m = 1, n = 2, p = 10$ or for $n : m : p = 2 : 1 : 10$ oe or 10 : 1 oe	
(b)		A1	for 1 : 10 oe	



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
22 (a)	4.5	P1	for a process to find the number of dark chocolates, eg $280 \times \frac{1}{7}$ oe (= 40)	
		P1	for a process to find one part of the ratio for milk chocolates to white chocolates eg $(280 - "40") \div (1 + 3)$ (= 60)	
		P1	for process to find the number of white chocolates, eg $"60" \times 3$ (= 180) or $280 - "40" - "60"$ (= 180)	Condone milk, white incorrectly labelled
		P1	for a ratio of white chocolates : dark chocolates eg $"180" : "40"$ oe or for a process to find the value of n eg $"180" \div "40"$	Labels not required for this mark, but if seen must be correct Must be a 2-part ratio. Allow $"40" : "180"$ if labelled as dark chocolate : white chocolate oe
		A1	(dep P3) for 4.5 oe	A correct answer with no supportive working gets 0 marks Condone answer of 4.5:1
(b)	No with reason	C1	for No with reason Acceptable examples No, the number of dark chocolates and white chocolates has not changed No, the ratio of $n:1$ only involved white and dark chocolates No, eating milk chocolates doesn't change the rest No, the ratio of dark to white chocolates doesn't change. Not acceptable examples Yes,... No, it doesn't matter how many milk chocolates are eaten No, the number of white chocolates doesn't change No, the number of dark chocolates doesn't change	Reason must refer to or imply both dark and white chocolates

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
9	(a)	bar at 11 for cricket	M1 for reading from graph of 12 or 17	Where [12] and [17] are their attempt at reading from the graph. May be implied by bar of height $40 - ([12] + [17])$ Condone bar of different width to those given or freehand bar. Shading not required. Bar of height 11 drawn implies M1M1C1 Accept other equivalent fractions. Do not accept equivalent decimals or percentages
			M1 (dep) for $40 - ([12] + [17]) (=11)$	
		C1	for bar drawn at 11 for cricket	
	(b)	$\frac{3}{10}$	M1 for $\frac{12}{40}$ or $\frac{6}{20}$	
		A1	cao	
	(c)	$\frac{5}{9}$	B1 for $\frac{5}{9}$ or equivalent fraction	Accept $n = 1.25$ Do not accept 1.25 alone or $n : 1.25$
	(d)	1.25 : 1	B1 for $1.25 : 1$ or $\frac{5}{4} : 1$ or $1\frac{1}{4} : 1$	
10	(a)	reflection	B2 (B1 for a fully correct reflection for a correct reflection in any single mirror line or for at least two correct reflected lines)	
	(b)	$y = 1$	B1 $y = 1$ oe	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
22	Shown with reasons	M1	for method to find ACD using parallel lines eg $BCA = 125$ and $ACD = 180 - 125 (= 55)$ or $BCF = 180 - 125 (= 55) = ACD$ or $FCD = 125$ and $ACD = 180 - 125 (= 55)$ or $CFG = 180 - 125 (= 55) = ACD$	Angles must be clearly labelled on the diagram or otherwise identified. Correct method can be implied from angles on the diagram if no ambiguity or contradiction.
		M1	for method to find ADC eg $180 - 110 (= 70)$ or for method to find CAD eg $180 - ("70" + "55") (= 55)$ or $110 - "55" (= 55)$	
		A1	for $ACD = 55$ and $CAD = 55$	
		C1	for one correct parallel lines reason linked to their method eg <u>Corresponding</u> angles are equal <u>Allied</u> angles / <u>Co-interior</u> angles add up to 180 <u>Alternate</u> angles are equal	
		C1	for one other reason stated linked to their method eg <u>Angles</u> on a straight <u>line</u> add up to 180 <u>Angles</u> in a <u>triangle</u> add up to 180 Vertically <u>opposite angles</u> are equal OR <u>Vertically opposite</u> angles are equal The <u>exterior angle</u> of a triangle is <u>equal</u> to the sum of the <u>interior opposite angles</u> . <u>Angles</u> in a <u>quadrilateral</u> add up to 360. Accept "4-sided shape"	
23	17.5	P1	for a first step, eg $5 \times 14 (= 70)$ or $14 \div 4 (= 3.5)$ or $5 \div 4 (= 1.25)$ or $4 \div 5 (= 0.8)$	Could be done algebraically. 11.2 as answer scores no marks.
		A1	oe	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
(b)	4	M1	for a correct first step, eg for adding 7 to both sides $5y - 7 + 7 < 16 + 7$ or for dividing throughout by 5 eg $\frac{5y}{5} - \frac{7}{5} < \frac{16}{5}$ or for showing 4.6 (oe) as the critical value or for $5 \times 4 - 7$ with 13 seen as answer	Allow use of any inequality or as an equation for the first mark Award 1 mark for 4.6 oe, eg $y = \frac{23}{5}$ or $y < 4.6$
		A1	for 4 or $y = 4$ with no incorrect working	An answer of 4 from incorrect working can score 1 mark at most.
24	4 packs and 5 boxes,	P1	for start of a process to find common multiples of 30 and 24, eg writes down at least 3 multiples of 30 and at least 3 multiples of 24 or draws factor trees for both 30 and 24 with no more than 1 error in total or draws a correct Venn diagram	30, 60, 90, 120, 150, 180, 210, 240 ... 24, 48, 72, 96, 120, 144, 168, 192, 216, 240, ... Condone the inclusion of 1 in factor trees or Venn diagrams for this mark
	or any multiple	P1	for identifying a common multiple eg 120 or 240 or $5 \times 3 \times 2 \times 2 \times 2$ oe	May use any common multiple, 120, 240, 360...
		A1	for 4 packs and 5 boxes or any multiple of this pairing eg 8, 10	Award 0 marks for a correct answer without correct supportive working.
25	20	M1	for $30 \times 4 \div 6$ oe	
		A1	cao	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
19 (a)	0.517(0189759)	M1	for any correct partial calculation, eg 40.113 or 6.333(482454) or 12.25 or answer of 0.51 or 0.52 or digits 517...	Answer must be given to at least 3 decimal places rounded or truncated. Check first 3 significant figures only. Do not accept trailing 0, eg 0.520
		A1	for 0.517(...)	
	(b) 0.52	B1	for 0.52 or ft their answer to part (a) correctly rounded to 2 sf, provided part (a) has at least 3 sf	
20	16.2	M1	for a correct first step to find BC , eg $19^2 = 10^2 + BC^2$ or $19^2 - 10^2 (= 261)$ or $\sqrt{19^2 - 10^2}$ or $\sqrt{261}$ or $3\sqrt{29}$	Can use alternative letter for BC provided intention is clear If using an alternative method using trigonometry must have BC as the only unknown ISW incorrect rounding if answer given in range
		A1	for answer in the range 16.1 to 16.2	
21 (a)	$2 \times 3 \times 3 \times 5$	M1	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 or for 2, 3, 3, 5	Condone the inclusion of 1 for this mark Accept $2 \times 3^2 \times 5$ Accept $2^2 \times 3^2$ or $2 \times 2 \times 3 \times 3$
		A1	for $2 \times 3 \times 3 \times 5$ oe	
	(b) 36	B1	for 36	
22	4	M1	for method to use formula, eg $72 \div 6 (= 12)$ or $72 \div 9 (= 8)$	Can be implied by $\frac{72}{6}$ or $\frac{72}{9}$ cao
		A1	cao	



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
23 (a)	200	M1	for $120 \times 5 \div 3$ oe	Any statement referring to the same amount of water flowing from each tap is acceptable.
		A1	cao	
		C1	Statement that each tap fills at the same rate or that the rate does not change over time Examples Acceptable responses: Taps are running at the same speed They (clearly referring to taps) all fill the pool with the same volume of water The amount of water is the same in the same time (again referring to taps) Each tap is doing a fifth of the filling That all taps take equal time to fill the pool All taps produce the same amount of water That the water flow stays at the same rate over the whole time. Non acceptable responses It will take more time because there are less taps The less taps used the longer it takes to fill the pool That 1 tap can take up to 24 mins each 3 taps will take longer to fill the pool	
24 (a)	16 to 20	P1	for using time = $\frac{\text{distance}}{\text{speed}}$, eg $\frac{1}{200}$ or $\frac{1}{213}$ or for 1 hour = 60×60 (= 3600) seconds	Calculation could be done in stages.
		P1	complete process, eg $\frac{1}{200} \times 60 \times 60$ oe or $\frac{1}{213} \times 60 \times 60$	
		A1	for answer in range 16 to 20	
		C1	(dep on correct use of time = $\frac{\text{distance}}{\text{speed}}$) for reason related to their response to part(a), eg overestimate as speed rounded down	
(b)	decision with reason			



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” $\times 4/3$ – “18” or “24” – “24” $\times 3/4$ cao	



Paper: 1MA1/2F																
Question	Answer	Mark	Mark scheme	Additional guidance												
16	2	P1 P1 A1	for a calculation from within the list $4 \times 12 \div 4 \div 6$ eg $4 \times 12 (= 48)$ or $12 \div 4 (= 3)$ or $6 \div 4 (= 1.5)$ or $4 \div 6 (= 0.66\ldots)$ for a complete process, eg $(\text{“}48\text{”} \div 6) \div 4$ or for $\text{“}0.6\text{”} \times 12 \div 4$ cao	Accept $12 \div 6$ as a full process												
17	176	M1 M1 A1	for a method to find 5 products within intervals (including end points) for $\Sigma \text{“}fx\text{”} \div (8 + 14 + 24 + 30 + 4)$ or $(155 \times 8 + 165 \times 14 + 175 \times 24 + 185 \times 30 + 195 \times 4) \div (8 + 14 + 24 + 30 + 4)$ or $(\text{“}1240\text{”} + \text{“}2310\text{”} + \text{“}4200\text{”} + \text{“}5550\text{”} + \text{“}780\text{”}) \div \text{“}80\text{”}$ or $\text{“}14080\text{”} \div \text{“}80\text{”}$ cao	<table><tr><th>Min fx</th><th>Max fx</th></tr><tr><td>1200</td><td>1280</td></tr><tr><td>2240</td><td>2380</td></tr><tr><td>4080</td><td>4320</td></tr><tr><td>5400</td><td>5700</td></tr><tr><td>760</td><td>800</td></tr></table> $\Sigma \text{“}fx\text{”}$ must come from 5 products fx within intervals (including end points)	Min fx	Max fx	1200	1280	2240	2380	4080	4320	5400	5700	760	800
Min fx	Max fx															
1200	1280															
2240	2380															
4080	4320															
5400	5700															
760	800															
18 (a)	(2, 1)	B1	cao													
(b)	Description	C1	correct description, eg as the amount of rainfall decreases the number of hours of sunshine increases	Accept negative correlation Ignore any comment about strength Any numbers used in the description must be within tolerance												
(c)	3 to 4	M1 A1	for a suitable line of best fit drawn, or for a point marked at $(x, 7)$, or a horizontal line drawn from 7 across to $(x, 7)$ where x is in the range 2.5 to 4 answer in the range 3 to 4													

Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
11		Offer 1 (supported)	P1 P1 C1	for a process to find the cost of a number of lessons in Offer 1, eg. $24 \times (12 - 1)$ (= 264) or for a process to find 5% (or 95%) of an appropriate amount, eg. 24×0.05 (= 1.20) or 24×0.95 (= 22.80) in Offer 2 for a complete process leading to values to be used for comparison, eg. $24 \times (12 - 1)$ (= 264) and $24 \times 0.95 \times 12$ (= 273.60) Offer 1 and correct values, eg. (£)264 and (£)273.6(0) used for comparison
12	Complete methods $3.60 \div 2.5 \times 3.5$ or $3.60 \div 5 \times 7$ or $3.5 \div (2.5 \div 3.6)$ or $\frac{3.5}{2.5} \times 3.6$ or $3.6 \div \frac{2.5}{3.5}$	5.04	M1 A1	for a correct first step to find the cost of a unit of weight (eg. 1 kg or 0.5 kg) eg $3.60 \div 2.5$ (= 1.44) or $3.60 \div 5$ (= 0.72) or a complete alternative method for 5.04 (accept £5.04p)
13	(a) (b) (c)	(-2) -1.5 -1 -0.5 (0) 0.5 Correct line 2.6	B2 [B1] M1 A1 B1	for a fully correct table for 2 or 3 correct entries] for correctly plotting at least 5 of their points (provided B1 scored in part (a)) or for a straight line with gradient 0.5 or for a straight line through (0,-1) with a positive gradient for a correct line between $x = -2$ and $x = 3$ for answer in the range 2.5 to 2.7 or fit a single straight line with positive gradient



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
7 (a)	D	B1	cao	
(b)	B	B1	cao	
(c)	Shown	M1	for number of green counters, eg $12 - (3+1+2) = 6$ OR for $\frac{3}{12}$ oe or $\frac{1}{12}$ oe or $\frac{2}{12}$ oe linked to the appropriate colour	This is awarded for a correct first step
		M1	for $1 - (\frac{3}{12} + \frac{1}{12}) (= \frac{8}{12})$ or $\frac{2}{12} + \frac{6}{12} (= \frac{8}{12})$ OR for method to find $\frac{2}{3}$ of 12, eg. $12 \div 3 \times 2 (= 8)$	This is awarded for a fully correct method from which the correct answer of $\frac{2}{3}$ can be found Sight of $\frac{8}{12}$ gets M2
		C1	for correct conclusion supported by accurate figures, eg $\frac{8}{12} = \frac{2}{3}$ or $\frac{2}{3}$ of 12 = 8 and number of yellow + green = $2 + 6 = 8$	
8	36	M1	for method to find cost of 1 kg, eg $54 \div 3 (= 18)$ or $54 \div 3 \times 2$ oe	
		A1	cao	
9 (a)	Radius	B1	cao	Accept spelling mistakes
(b)	Tangent	B1	cao	Accept spelling mistakes



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
17 (a)	Frequency diagram	C3	for a fully correct frequency diagram	If probabilities used instead of frequencies then maximum of C2 can be awarded
	See end of m/s	(C2)	for at least 5 correct values in the frequency diagram)	
(b)	$\frac{12}{72}$	(C1)	for at least 3 correct values in the frequency diagram)	Accept equivalent decimal or percentage forms of probability Ignore errors in cancelling of their $\frac{12}{72}$
		M1	for $\frac{a}{72}$ where $0 < a < 72$ and a is an integer or $\frac{12}{b}$ where $b > 12$ and b is an integer or $12 : 72$ or ft their values for 72 and/or 12 from (a)	
		A1	for $\frac{12}{72}$ oe or ft (a)	
18	100	M1	M1 for a correct first step, eg $25 \div 10 (= 2.5)$ or $40 \div 10 (= 4)$ or 20 (scones) = $40 \times 2 (= 80\text{g})$ or 5 (scones) = $40 \div 2 (= 20\text{g})$	Multiplier may be seen as evidence of this mark
		A1	cao	
19	288	M1	for a method to find 20% eg $240 \times 20 \div 100 (= 48)$ or shows a multiplier of 1.2 oe or 120%	
		M1	for a complete method eg $240 + "48"$ or 240×1.2 oe or $240 \times 120 \div 100$	
		A1	cao	



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
15	$\frac{5}{14}$	M1 A1	for method to multiply fractions, eg $\frac{6 \times 5}{7 \times 12}$ or to simplify, eg $\frac{1}{7} \times \frac{5}{2}$ OR for a fractional answer equivalent to $\frac{5}{14}$ cao	$\frac{30}{84}$ $\frac{15}{42}$ $\frac{10}{28}$
16	750	M1 A1	for $250 \times (60 \div 20)$ oe or $150 \times (60 \div 20)$ oe or $100 \times (60 \div 20)$ oe cao	
17	27.5	P1 P1 P1 A1	for process to find number of yellow and green counters, eg $200 - 38 - 52 (= 110)$ OR for process to express red and blue counters as a percentage of 200, eg $\frac{38 + 52}{200} \times 100$ oe (= 45) for process to find number of yellow counters and/or the number of green counters eg " 110 " $\div 2 (= 55)$ OR for process to express the sum of the yellow and green counters as a percentage of 200, eg $\frac{110}{200} \times 100 (= 55)$ or $100 - "45" (= 55)$ for a complete process to express the number of yellow counters as a percentage, eg $\frac{55}{200} \times 100$ or " 55 " $\div 2$ for 27.5 oe	



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: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
16	5	P1	for start to process eg $7 \times 20 (= 140)$ and $3 \times 21 (= 63)$ or $(7 \times 20) + (3 \times 21) + 22 (= 225)$	May be written near table $7 \times 20 (= 140)$ and $3 \times 21 (= 63)$ minimum requirement for P1
		P1	for a complete process to find the missing frequency eg $(320 - "225") \div 19$ or $320 - "225" = (95)$ and $"95" \div 19$	May be seen as two calculations
		A1	cao	Please check the table. Correct answer in the table without working award 3 marks
17	90	P1	for a process to find the number of batches for at least 2 ingredients, eg $900 \div 225 (= 4)$ or $1000 \div 110 (= 9.09..)$ or $1000 \div 275 (= 3.6....)$ or $225 \div 75 (= 3)$ OR A full method to find the maximum number of biscuits for 1 ingredient eg $900 \div 225 \times 30$ OR Amount required for 1 biscuit for at least 2 ingredients eg $225 \div 30 (= 7.5)$ or $110 \div 30 (= 3.6..)$ or $275 \div 30 (= 9.1..)$ or $75 \div 30$ $(= 2.5)$ OR Amount required for 3 batches for at least 2 ingredients eg $225 \times 3 (= 675)$ or $110 \times 3 (= 330)$ or $275 \times 3 (= 825)$ or $75 \times 3 (= 225)$	
		P1	(dep P1) for a complete process to find the maximum number of biscuits after considering at least 3 different ingredients eg $"3" \times 30$	They must use their smallest multiplier after considering at least 3 different ingredients
		A1	(dep P2) cao from fully correct working	90 without working award no marks



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
19	40	P1	for a process to find the maximum number of batches for one ingredient, eg $500 \div 175 (= 2.85\dots)$ or $300 \div 75 (= 4)$ or $625 \div 250 (= 2.5)$ OR for a process to find the amount of one ingredient for 1 biscuit, eg $175 \div 16 (= 10.9375)$ or $75 \div 16 (= 4.6875)$ or $250 \div 16 (= 15.625)$ OR for multiples of 175:75:250, eg $175 \times 2 (= 350)$ and $75 \times 2 (= 150)$ and $250 \times 2 (= 500)$	Figures may be truncated or rounded
		P1	(dep P1) identifies flour as the limiting factor OR for a process to find the maximum number of biscuits for one ingredient, eg butter: $"2.85" \times 16$ or $500 \div "10.9\dots"$ oe ($= 45.7\dots$) sugar: $"4" \times 16$ or $300 \div "4.6\dots"$ oe ($= 64$) flour: $"2.5" \times 16$ or $625 \div "15.625"$ oe ($= 40$)	
		A1	cao SCB2 for answer of 32	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
10	Yes and 750	P1	for beginning to work with proportion eg $60 \div 20 (= 3)$ or $900 - 250 (= 650)$ or $250 \div 20 (= 12.5 \text{ oe})$ or $900 \div 60 (= 15)$	Sugar = 600 (g) or Small eggs = 6 (eggs) implies P1 Sight of 750 gains P2
		P1	for a complete process to see if there is enough peanut butter eg $"3" \times 250 (= 750)$ or $900 \div "3" (= 300)$ or $"650" - 250 - 250 (= 150)$ oe or $"12.5" \times 60 (= 750)$ or for a complete process to work out how many cookies he can make eg $900 \div "12.5" (= 72)$ or for process to work out how much peanut butter is needed for one cookie and how much peanut butter he can use per cookie eg $250 \div 20 (= 12.5 \text{ oe})$ and $900 \div 60 (= 15)$	
		C1	Yes and accurate figure to compare eg 750 (g needed) or 150 (g over) or 300 (g per batch available) or 72 (cookies can be made) or 12.5 (g peanut butter per cookie needed) and 15 (g peanut butter per cookie available)	
11	Diagram	M1	for a correct base length (6 cm) drawn or correct height (9 cm) drawn or a fully correct enlargement of a scale factor not equal to 3	
		A1	fully correct enlargement	



Paper: 1MA1/1F																																				
Question	Answer	Mark	Mark scheme	Additional guidance																																
16	Pack of 8 (supported)	P1	for a process (for at least 2 packs) of division of price by quantity eg at least 2 of $180 \div 4 (= 45)$ or $320 \div 8 (= 40)$ or $600 \div 12 (= 50)$ OR any other process that could lead to a comparison of 2 packs eg $180 \times 2 (= 360)$ or $320 \div 8 (= 40)$ and “40” $\times 12 (= 480)$	Calculations could be in pounds or in pence <table><tr><td></td><td>4 pack</td><td>8 pack</td><td>12 pack</td></tr><tr><td>1</td><td>0.45</td><td>0.40</td><td>0.50</td></tr><tr><td>2</td><td>0.90</td><td>0.80</td><td>1.00</td></tr><tr><td>4</td><td>1.80</td><td>1.60</td><td>2.00</td></tr><tr><td>8</td><td>3.60</td><td>3.20</td><td>4.00</td></tr><tr><td>12</td><td>5.40</td><td>4.80</td><td>6.00</td></tr><tr><td>16</td><td>7.20</td><td>6.40</td><td>8.00</td></tr><tr><td>24</td><td>10.80</td><td>9.60</td><td>12.00</td></tr></table>		4 pack	8 pack	12 pack	1	0.45	0.40	0.50	2	0.90	0.80	1.00	4	1.80	1.60	2.00	8	3.60	3.20	4.00	12	5.40	4.80	6.00	16	7.20	6.40	8.00	24	10.80	9.60	12.00
			4 pack	8 pack	12 pack																															
		1	0.45	0.40	0.50																															
2	0.90	0.80	1.00																																	
4	1.80	1.60	2.00																																	
8	3.60	3.20	4.00																																	
12	5.40	4.80	6.00																																	
16	7.20	6.40	8.00																																	
24	10.80	9.60	12.00																																	
P1	for a complete process to give values that can be used for comparison of all 3 packs eg $180 \div 4 (= 45)$ and $320 \div 8 (= 40)$ and $600 \div 12 (= 50)$ OR $3.20 \div 8 (= 0.40)$ and “0.40” $\times 4 (= 1.60)$ and “0.40” $\times 12 (= 4.80)$ OR $1.80 \times 6 (= 10.80)$ and $3.20 \times 3 (= 9.60)$ and $6.00 \times 2 (= 12.00)$	Condone incorrect units. Pairwise comparison are possible, but check to see that this allows for a decision to be made. Check process. Assuming correct figures found: <table><tr><td colspan="2">Comparisons</td><td>Conclusion possible</td></tr><tr><td>4 vs 8</td><td>8 vs 12</td><td>Yes</td></tr><tr><td>4 vs 8</td><td>4 vs 12</td><td>Yes</td></tr><tr><td>4 vs 12</td><td>8 vs 12</td><td>No</td></tr></table>	Comparisons		Conclusion possible	4 vs 8	8 vs 12	Yes	4 vs 8	4 vs 12	Yes	4 vs 12	8 vs 12	No																						
Comparisons		Conclusion possible																																		
4 vs 8	8 vs 12	Yes																																		
4 vs 8	4 vs 12	Yes																																		
4 vs 12	8 vs 12	No																																		
A1	for ‘pack of 8’ and correct values that can be used to compare all 3 packs	Correct answer with no supportive working scores 0 marks. Do not allow A mark where inconsistent units would prevent comparison e.g. 0.40p and 45p																																		

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
17	180, 300, 75	M1	for complete method to find amount needed for 30 biscuits for one ingredient, eg $120 \div 20 \times 30 (= 180)$ oe eg $120 + 120 \div 2 (= 180)$ or for method to find a scale factor, eg $30 \div 20 (= 1.5)$ oe or for method to find amount needed for 10 biscuits for at least 2 ingredients eg $120 \div 2 (= 60)$ or $200 \div 2 (= 100)$ or $50 \div 2 (= 25)$ or for method to find amount needed for 1 biscuit for at least 2 ingredients eg $120 \div 20 (= 6)$ or $200 \div 20 (= 10)$ or $50 \div 20 (= 2.5)$	
		M1	for complete method to find amount needed for 30 biscuits for at least 2 ingredients, eg at least 2 of $120 \div 20 \times 30 (= 180)$ or $200 \div 20 \times 30 (= 300)$ or $50 \div 20 \times 30 (= 75)$ oe or eg at least 2 of $120 \times "1.5" (= 180)$ or $200 \times "1.5" (= 300)$ or $50 \times "1.5" (= 75)$ or eg at least 2 of $120 + "60" (= 180)$ or $200 + "100" (= 300)$ or $50 + "25" (= 75)$ or eg at least 2 of $30 \times "6" (= 180)$ or $30 \times "10" (= 300)$ or $30 \times "2.5" (= 75)$	
		A1	for all quantities correct	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
22	Zurich (supported)	P1	for one process to compare, eg eg Currency conversion, $3.5 \times 1.25 (= 4.375)$ or $7.20 \div 1.25 (= 5.76)$ or finds 1g in one place $\pounds 3.50 \div 200 (= 0.0175)$ or $7.20 \div 360 (= 0.02)$ or finds 200g in Zurich, $7.2 \div 360 \times 200 (= 4.0)$ or finds 360g in London, $3.5 \div 200 \times 360 (= 6.30)$ or finds grams per unit cost, $200 \div 3.50 (= 57.1...)$ or $360 \div 7.20 (= 50)$	Accept figures rounded or truncated to 2sf throughout
		P1	for a complete process to find comparable figures in the same currency, eg comparing 200g in £ or francs $3.5 \times 1.25 (= 4.375)$ and $7.2 \div 360 \times 200 (= 4.0)$ or " 4.0 " $\div 1.25 (= 3.20)$ OR comparing 360g in £ or francs " 6.30 " $\times 1.25 (= 7.875)$ or $3.5 \div 200 \times 360 (= 6.30)$ and $7.20 \div 1.25 (= 5.76)$ OR comparing 1g in £ or francs " 0.0175 " $\times 1.25 (= 0.0218...)$ and $7.20 \div 360 (= 0.02)$ or $\pounds 3.50 \div 200 (= 0.0175)$ and " 0.02 " $\div 1.25 (= 0.016)$ OR comparing quantity per unit cost in £ or francs $200 \div 3.50 (= 57.1...)$ and $360 \div "5.76" (= 62.5)$ or $200 \div "4.375" (= 45.7...)$ and $360 \div 7.20 (= 50)$	Accept working in pence Ignore incorrect units for P marks Award of this mark implies the previous mark
		C1	for Zurich supported by correct comparable values, eg 4.3(75 F) and 4(.0 F) or (£)3.2(0) or 7.8(75 F) or (£)6.3(0) and (£)5.76 or 0.021(8... F) and 0.02 (F) or (£)0.017(5) and (£)0.016 or 57(.1... g/£) and 62(.5 g/£) or 45(.7... g/F) and 50 (g/F)	Clear indication that bar is better value for money in Zurich supported by correct values for comparison Units not needed but if stated must be correct. Table with examples at end of mark scheme

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
17	No, not enough milk (supported)	P1 P1 C1 OR P1 P1 C1	Process to find amount needed (starting from recipe quantities) for a correct process to find amount needed of one ingredient, eg $100 \div 10 \times 15$ oe (= 150) or $200 \div 10 \times 15$ oe (= 300) or $100 \div 2 + 100$ (= 150) or $200 \div 2 + 200$ (= 300) or $40 \div 2 \times 3$ oe (= 60) or $2 \div 2 \times 3$ oe (= 3) or scale factor of 1.5 seen for a correct process to find amount needed of all the ingredients, eg $100 \div 10 \times 15$ oe (= 150) and $200 \div 10 \times 15$ oe (= 300) and $40 \div 10 \times 15$ oe (= 60) and $2 \div 10 \times 15$ oe (= 3) for statement that there is not enough milk with supporting evidence OR Process to find quantity of pancakes that can be made (working from the quantities of ingredients available) for a correct process to find the number of pancakes that can be made with one ingredient, eg $200 \div 100 \times 10$ oe (= 20) or $250 \div 200 \times 10$ oe (= 12.5) or $70 \div 40 \times 10$ oe (= 17.5) or $5 \div 2 \times 10$ oe (= 25) for a correct process to find the number of pancakes all ingredients could produce eg $200 \div 100 \times 10$ oe (= 20) and $250 \div 200 \times 10$ oe (= 12.5) and $70 \div 40 \times 10$ oe (= 17.5) and $5 \div 2 \times 10$ oe (= 25) for statement that there is not enough milk with supporting evidence	Must have correct figures for all ingredients, but it is not necessary to comment on the other ingredients. Any comment on the other ingredients must be correct. Award this mark for a complete process to find the amount of ingredients for a quantity of pancakes that uses all of one of the ingredients eg process to find amount of ingredients for 20 pancakes (flour). Must have correct figures for all ingredients, but it is not necessary to comment on the other ingredients.



Paper 1MA1: 2F				
Question	Working	Answer	Mark	Notes
10		Letters2send (supported)	P1	for the start of a process to find comparable costs at either shop, e.g. $150 \div 25 (= 6)$ or $150 \div 30 (= 5)$, $150 \div 10 (= 15)$, $2.10 \div 15 (= 0.14)$
			P1	for process to find cost from Letters2send, e.g. $(150 \div 25) \times 3.49 (= 20.94)$
			P1	for process to find cost at Stationery World, e.g. $(150 \div 30) \times 2 \times 2.10 (= 21)$
			C1	for correct conclusion with correct values from each shop (20.94 and 21)
				OR
			P1	for the start of a process to find comparable costs, eg $3.49 \div 25 (= 0.1396)$, $2.10 \div 10 (= 0.21)$, $25 \div 3.49 (= 7.1\dots)$, $2.10 \div 15 (= 0.14)$
			P1	for process to take into account the offer at Stationery World, eg buy 30 envelopes pay for 20,
			P1	for complete process to find values that can be used for comparison, eg $30 \times 0.13(96)$ and $2 \times 2.10 (= 4.2(0))$
			C1	for correct conclusion with correct values from each shop (4.1(88) and 4.2(0))



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: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	Yes with correct figures	P1 P1 P1 C1	begins to work with proportion eg $20 \div 2 (=10)$ or $20 \div 5 (=4)$ or $2.38 \div 2 (=1.19)$ or $5.60 \div 5 (=1.12)$ full process to find the cost of 20 pens or 20 folders eg. $20 \div 2 \times 2.38 (=23.8)$ or $20 \div 5 \times 5.60 (=22.4)$ or $2.38 \div 2 \times 20 (=23.8)$ or $5.60 \div 5 \times 20 (=22.4)$ full process to find total price or amount remaining eg “23.8” + “22.4” (=46.2) or $50 - “23.8” - “22.4” (=3.8)$ Yes with correct figures eg 46.2 or 3.8 (left)	Throughout monetary units not required; trailing zeros not needed. Can work in pence throughout ‘Yes’ might be implied from working eg $46.2 < 50$ or a statement that 3.8 is left, but 46.2 alone must also show an answer such as ‘Yes’ (may be written elsewhere). Working leading to 46.2 must be shown for this mark.
9	(a) Trapezium	B1	cao	Accept in either order.
	(b) C and D	B1	cao	
10	Reflection drawn	C1	for accurate reflection drawn	Can be hand drawn. Need not be shaded.
11	40	P1 P1 A1	for $100 - 30 (=70)$ or $1 - 0.3 (=0.7)$ or $1 - \frac{3}{10} (= \frac{7}{10})$ or $28 \div 7 \times 3 (=12)$ for a complete process eg $28 \div (“70” \div 10) \times 10$ or $28 + “12”$ cao	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
17	180.9	P1	for starting to work with proportion eg. $60 \div 100 (= 0.6)$ or $150 \div 100 (= 1.5)$ OR $100 \div 60 (= 1.66\ldots)$ or $100 \div 150 (= 0.66\ldots)$ OR $84 \div 100 (= 0.84)$ or $87 \div 100 (= 0.87)$ or $84 \div 10 (= 8.4)$ or $87 \div 10 (= 8.7)$ or $84 \div 2 (= 42)$ or $87 \div 2 (= 43.5)$ OR $100 \div 84 (= 1.19\ldots)$ or $100 \div 87 (= 1.14\ldots)$	
		P1	for a complete process to work out the calories in either item eg. $"0.6" \times 84 (= 50.4)$ or $"1.5" \times 87 (= 130.5)$ OR $84 \div "1.66\ldots" (= 50.4)$ or $87 \div "0.66\ldots" (= 130.5)$ OR $"0.84" \times 60 (= 50.4)$ or $"0.87" \times 150 (= 130.5)$ or $"8.4" \times 6 (= 50.4)$ or $"8.7" \times 15 (= 130.5)$ or $"42" \times 6 \div 5 (= 50.4)$ or $"43.5" \times 3 (= 130.5)$ OR $60 \div "1.19\ldots" (= 50.4)$ or $150 \div "1.14\ldots" (= 130.5)$	
		P1	(dep on P2) for a complete process to find total number of calories in the breakfast, eg. $"50.4" + "130.5"$	
		A1	for 180.9 or 181	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
18	952	P1	for starting to work with parts, eg. $6 \times 60 \div 10 (= 36)$ or $10 \div 6 (= 1.66\ldots)$ or $6 \div 10 (= 0.6)$ or $13 \times 60 \div 15 (= 52)$ or $15 \div 13 (= 1.15\ldots)$ or $13 \div 15 (= 0.866\ldots)$ OR for $60 \div 10 \times 12 (= 72)$ or $10 \times 60 \div 15 (= 40)$	
		P1	for a full process to find the number of parts made by machine A eg $"36" \times 12 (= 432)$ or $12 \times 60 \div "1.66\ldots" (= 432)$ or $12 \times 60 \times "0.6" (= 432)$ OR $"72" \times 6 (= 432)$	
		P1	for a full process to find the number of parts made by machine B eg $"52" \times 10 (= 520)$ or $10 \times 60 \div "1.15\ldots" (= 520)$ or $10 \times 60 \times "0.866\ldots" (= 520)$ OR $"40" \times 13 (= 520)$	
		A1	for 952 or 432 and 520	
19	Shaded region	M1	for $180 \div 30 (= 6)$ or $150 \div 30 (= 5)$	This may be just used in a correct locus drawn on the diagram
		M1	draws an arc of radius "6 cm" centre <i>A</i> or draws a line segment parallel to <i>BC</i> and "5 cm" away	Ignore any additional arcs or lines drawn
		M1	for an arc of radius "6 cm" centre <i>A</i> and a line parallel to <i>BC</i> and "5 cm" away with no additional arcs or lines drawn	
		A1	Answer within tolerance with region shaded	Accept shading out leaving the required region unshaded



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
14	3.3(0)	P1	for a process to find cost of 1 kg of carrots, eg $1.80 \div 3 (= 0.60)$	Could work in £ or p for P marks Condone incorrect money notation
		P1	for a start to a process to find cost of 1kg of potatoes, eg $3.45 - 2 \times "0.60" (= 2.25)$ or $(1.80 + 3.45) \div 5 (= 1.05)$	1 kg of potatoes = (£)0.45 or 45p
		OR	for a process to find the cost of 4 kg of carrots, eg $"0.60" \times 4 (= 2.40)$	
		P1	(dep on P2) for a complete process to find the cost of 4 kg of carrots and the cost of 2 kg of potatoes, eg $"0.60" \times 4 (= 2.40)$ and $("2.25" \div 5) \times 2 (= 0.90)$ or $"0.60" \times 4 (= 2.40)$ and $("1.05 - "0.60") \times 2 (= 0.90)$	
		A1	cao	Award 0 marks for a correct answer with no supportive working.
15 (a)	$2a + 2d$	B1	cao	Accept $2 \times a + 2 \times d$
(b)	$y(6y - 5)$	B1	cao	Accept $y \times (6y - 5)$
(c)	11	M1	for isolating x terms, eg $4x = 37 + 7$ or $4x = 44$ or for $x - \frac{7}{4} = \frac{37}{4}$ or for $37 + 7 = 44$ followed by $"44" \div 4 (= 11)$	
		A1	cao	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)	82.5	M1	for a complete method, eg $132 \div 8 \times 5$	132 – 82.5 (= 49.5) M1 implied
		A1	cao	
		M1	converts into decimals or percentages or equivalent fractions, at least 2 conversions correct or for any 3 fractions in correct order	0.25, 0.28(125), 0.32(8125), 0.37(5) Accept in reverse order for this mark Accept expressed in equivalent decimals or percentages or fractions or in mixed numerical form
		A1	cao	
13 (b)	$\frac{1}{4}, \frac{9}{32}, \frac{21}{64}, \frac{3}{8}$	M1	converts into decimals or percentages or equivalent fractions, at least 2 conversions correct or for any 3 fractions in correct order	0.25, 0.28(125), 0.32(8125), 0.37(5) Accept in reverse order for this mark Accept expressed in equivalent decimals or percentages or fractions or in mixed numerical form
		A1	cao	
		P1	for a process to find the price for one deal, eg 6 pints on 1 st deal, $75 \times 2 (= 150)$ or 8 pints on 2 nd deal, $128 \times 1.5 (= 192)$ oe	Accept in mixed units of pence and pounds Might look at a price difference for a consistent number of pints
		P1	for a process to find the price for both deals, eg 6 pints on 1 st deal, $75 \times 2 (= 150)$ and 8 pints on 2 nd deal, $128 \times 1.5 (= 192)$ oe	
13	4 pint with correct figures	P1	for a process to find the cost per pint for both deals, eg “150” $\div 6 (= 25)$ and “192” $\div 8 (= 24)$ or for prices for a consistent number of pints for both deals eg for 2 pints “1.5” $\div 3 (= 0.5)$ and “1.92” $\div 4 (= 0.48)$ or a comparison using a unit price eg “150” $\div 6 \times 8 (= 200)$ and $128 \times 1.5 (= 192)$ oe	Accept in mixed units of pence and pounds Might look at a price difference for a consistent number of pints
		P1	for a process to find the price for both deals, eg 6 pints on 1 st deal, $75 \times 2 (= 150)$ and 8 pints on 2 nd deal, $128 \times 1.5 (= 192)$ oe	
		P1	for a process to find the cost per pint for both deals, eg “150” $\div 6 (= 25)$ and “192” $\div 8 (= 24)$ or for prices for a consistent number of pints for both deals eg for 2 pints “1.5” $\div 3 (= 0.5)$ and “1.92” $\div 4 (= 0.48)$ or a comparison using a unit price eg “150” $\div 6 \times 8 (= 200)$ and $128 \times 1.5 (= 192)$ oe	Accept in mixed units of pence and pounds Might look at a price difference for a consistent number of pints
		C1	“4 pint” with two correct comparative costs calculated making full use of both offers	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
19	(a) 15	B1	cao	Accept readings from the graph as an indication at this stage
	(b) 4.6	B1	for an answer in the range 4.4 to 4.8	
	(c) 12	M1	for a method to calculate speed eg distance ÷ time (could be implied from figures used) eg $4 \div 20 (= 0.2)$ oe, $4 \div 0.33(\dots)$ oe or $4 \div 1/3$ oe	
		A1	cao	
20	100g butter 25g sugar 1 egg	P1	for process to find the amount needed of one ingredient for 25 scones	amount needed: 200g butter 875 flour 75 sugar 5 eggs Flour can be excluded, but no incorrect information about flour should be given.
		P1	for process to find the amount needed for at least three ingredients for 25 scones or for process to find the correct amount more for at least two of butter, sugar, eggs	
		P1	for complete process to find amount more for each of butter, sugar, eggs	
		C1	for correct amounts more shown for butter, sugar, eggs	
21	$a = \frac{p+9}{3}$	M1	for correct first step to rearrange eg $p + 9 = 3a - 9 + 9$ or $\frac{p}{3} = \frac{3a-9}{3}$ oe or answer ambiguously shown eg $a = p + 9 \div 3$ or given as $\frac{p+9}{3}$ oe	May be seen in different equivalent forms but must be carried out, not just intention seen.
		A1	oe	

Paper: 1MA1/3F					
Question	Answer	Mark	Mark scheme	Additional guidance	
24	Yes (supported)	P1	for a process to find the volume of 1 tank eg $\pi \times 40^2 \times 160$ (= 804247.7... or 804.2...or 256000 π)	Could be truncated or rounded	
		P1	for complete process to find the volume of 4 tanks, [volume of tank] $\times 4$ eg $\pi \times 40^2 \times 160 \times 4$ (= 3216990.8... or 3216.9... or 1024000 π) or for process to find volume of fertiliser available per tank eg $32 \times 1000 \div 4$ (= 8000)	For this mark [volume of tank] must come from a calculation involving π , r^2 , h	
		P1	for a process to find the amount of mixture for 1 tank eg [volume of tank] $\div 101$ (= 7962.8...) or 4 tanks (= 31851.3...) OR for a process to find volume of mixture that 32 litres of fertiliser will make eg 32000×101 (= 3232000) or 32×101 (= 3232)	For this mark [volume of tank] must come from a calculation involving π , r^2 , h or be stated as their volume	
		C1	for Yes supported by correct figures shown eg a comparable figure in the range 31.8 to 31.9 (litres) or in the range 31800 to 31900 with 32000 (cm ³) or in the range 3216 to 3217 with 3232 (litres) or in the range 3216000 to 3217000 with 3232000 (cm ³) or in the range 7958 to 7963 with 8000 (cm ³)	There are other possible pairs of values which can be used in the comparison	
25	(a)	16	M1	for a ratio of $\frac{20}{5}$ or $\frac{5}{20}$ or 4 or 0.25 or $\frac{5}{4}$ or $\frac{4}{5}$ or 1.25 or 0.8 oe	
			A1	cao	
	(b)	5.5	M1	for $22 \times "0.25"$ or $22 \div "4"$ oe	
			A1	oe	



Paper: 1MA1/1F					
Question	Answer	Mark	Mark scheme	Additional guidance	
9	(a)	(5, 2)	B1	cao	
	(b)	(4, −2) marked	B1	for the point (4, −2) unambiguously marked on the grid	Allow without label, provided unambiguous
	(c)	(1, 3)	B1	cao	
	(d)	$y = -4$ shown	B1	for correct single line unambiguously marked	Need not be labelled if clear. Accept a single line drawn freehand of any length. Accept a dotted (or dashed) line
10	Yes (supported)	P1	for an initial process, eg $6 \times 2 (=12)$ or $80 \div 2 (=40 = 0.40)$ oe or $6 \times 0.8 (= 4.80)$ oe or $6 \div 2 (= 3)$		May work in pounds or pence
		P1	for a process using the special offer eg $6 \times "40" (= 240 \text{ or } 2.40)$ oe or $"4.80" \div 2 (= 2.40)$ oe or $2 + "0.40" (= 2.40)$ oe or $"3" \times 0.8 (= 2.40)$		Allow use of inconsistent units for the first 2 marks
		P1	for a complete process to find figures to compare, eg $6 \times 2 + 6 \times "0.40" (= 14.40)$ oe or $15 - "12" - "2.40" (= 0.60 \text{ or } 60\text{p})$		
		C1	for Yes with correct comparable figures, eg Yes and (£)14.4(0) or Yes and (£)0.6(0) or 60p change		Award 0 marks for a correct answer with no supportive working. Answer of 'No' gets C0 irrespective of working, correct or not. Ignore incorrect value for change, if (£) 14.4(0) seen

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
13 (a)(i)	30	B1	cao	
(ii)	10	B1	cao	
(b)	Drawn	M1	for a line from (1330 , 35) to (1500 , 35) or a line to the x axis from a point on $y = 35$ to 1600 on the x axis	
		A1	fully correct graph	
(c)	35	B1	for 35 or ft their graph	ft must be $35 \div \text{time duration for their line}$
14	1.3	M1	for working with boxes or bags eg $600 \div 120 (= 5)$ or $1000 \div 270 (= 3.7(037..))$ $6 \div 120 (=0.05)$ or $10 \div 270 (= 0.037(037..))$	Cost $\div$ quantity For the M marks allow working in £ instead of p.
		M1	for working with bags and boxes where they are working to the same quantities of boxes and bags eg $600 \div 120 (= 5)$ and $1000 \div 270 (= 3.7(037..))$ $6 \div 120 (=0.05)$ and $10 \div 270 (= 0.037(037..))$	Other values are possible where they are using alternative quantities of boxes and bags, but these must be the same quantities of each.
		M1	for finding the difference eg “5” – “3.7(037..)” (= 1.29.. to 1.3) or “0.05” – “0.037(037..)” (= 0.0129.. to 0.013)	Must have consistent units for this mark.
		A1	for answer in the range 1.29 to 1.3	If an answer is given in the range in working and then rounded incorrectly award full marks.

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	New York (supported)	P1	for a conversion between kg and lbs, eg $2 \times 2.2 (= 4.4)$ or $5 \div 2.2 (= 2.27\dots)$	See page at end of mark scheme £ per lb US dollars per kg lbs per £ kg per US dollar Condone the incorrect assignment of units for all 3 P marks Final comparable values can be truncated or rounded, they just need to be accurate enough to allow a comparison
		P1	for a conversion between pounds and US dollars, eg $3.75 \times 1.2(0) (= 4.50)$ or $4.9(0) \div 1.2(0) (= 4.08\dots)$	
		P1	for a process to find figures to compare, eg $3.75 \div "4.4" (= 0.85\dots)$ and $"4.08\dots" \div 5 (= 0.81(6\dots))$ or $"4.50" \div 2 (= 2.25)$ and $4.9(0) \div "2.27\dots" (= 2.15(6\dots))$ or $"4.4" \div 3.75 (= 1.17\dots)$ and $5 \div "4.08" (= 1.22\dots)$ or $2 \div "4.5" (= 0.44\dots)$ and $"2.27" \div 4.9(0) (= 0.46\dots)$	
		C1	for New York with correct comparable figures, eg 0.85 and 0.81(6...) OR 2.25 and 2.15(6...)	
26	23.75 and 23.85	B1	for 23.75 in the correct position	Accept 23.849 or 23.8499(9...)
		B1	for 23.85 in the correct position	

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
23 (a)	600	P1	for starting process to calculate amount of flour eg $60 \div 15 (= 4)$ or $3 \times 50 (= 150)$	4 implied by 200g of sugar
		P1	for complete process eg $\frac{60}{15} \times "150"$	
		A1	cao	
(b)	2	P1	for process to calculate amount of butter eg $\frac{60}{15} \times 2 \times 50 (= 400)$	[butter] must be clearly stated or calculated, may be seen in part (a)
			OR for process to calculate the number of packs of butter needed eg [butter] $\div 250$	
		A1	cao	
24	18	M1	for listing factors of 72 and 90, at least 4 correct for each (with no more than 1 incorrect in each list), could be in factor pairs	Factors of 72: 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72 Factors of 90: 1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90
			OR for the prime factors of 72 (2, 2, 2, 3, 3) or 90 (2, 3, 3, 5)	
		A1	for 18 or 2×3^2 oe	
			SC B1 for answer of 6 or 9 if M0 scored	
25	sketch	M1	for sketch of a cylinder	Hidden edges may or may not be shown
		A1	sketch of cylinder, with dimensions shown	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
17 (a)	5	P1	for finding the number of oranges required eg $8 \div 2 \times 30 (=120)$ oe or for finding the number of oranges left from use of at least 2 boxes eg $24 \times 2 - 30 (=18)$ or $24 \times 4 - 90 (=6)$ or finds the correct amount of juice possible from at least two boxes eg $24 + 24$ is 2 litres or $24 + 24 + 24$ is 4 litres	A build up method with no process shown must use fully correct figures
		P1	for a complete process eg " $120 \div 24 (=5)$ oe or $30 + 30 + 30 + 30 (=120)$ and $24 + 24 + 24 + 24 (=120)$ or $24 \times 2 - 30 = 18$, $18 + 24 = 42$, $42 - 30 = 12$, $12 + 24 = 36$, $36 - 30 = 6$, $6 + 24 = 30$	
		A1	cao with no arithmetic errors seen	
	9 : 2		SCB1 for an answer of 10 supported by working	This mark cannot be awarded if the supporting work has an arithmetic error An answer only and no working is no marks
		M1	for a partially simplified correct ratio eg $126 : 28$ or any other equivalent ratio or $2 : 9$	
		A1	cao	
18	Rotation 180° about $(-1, 0)$	C2	rotation 180° about $(-1, 0)$ or enlargement sf -1 centre $(-1, 0)$	Award no marks if more than one transformation is given
		(C1	rotation 180° or rotation about $(-1, 0)$ OR enlargement sf -1 or enlargement centre $(-1, 0)$)	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	shop A from correct figures	P1	for start of process to find the number of packs needed from at least one shop, eg $30 \div 4 (= 7.5 \text{ or } 8)$ or $30 \div 6 (= 5)$	
		P1	for process to find cost of batteries from at least one shop, eg $(30 \div 4) \times 1.6 (= 12.8 \text{ or } 12)$ or $(30 \div 6) \times 2.7 (= 13.5)$	
		P1	for a complete process to find the cost of batteries from both shops using whole packs eg $"8" \times 1.6 (= 12.8)$ and $"5" \times 2.7 (= 13.5)$	"8" must come from "7.5" rounded up
		C1	for shop A with both 12.8(0) and 13.5(0)	
(b)	No effect (supported)	C1	(ft) for "has no effect" with reason Acceptable examples No, since A is 12 and B is 13.5(0) No, since A is just 80(p) less and B is the same. No, since A is less and B has not changed. No, since A is 1.5(0) less No, since 40(p) is less than 45(p) No, as batteries in B are 5p more Not acceptable examples Yes There is no change (unsupported) No, since A is less (incomplete)	If figures are given as part of the answer they must be correct

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
26 (a)	Yes (supported)	P1	for start of process, eg $5 \times 9 (= 45)$ or $10 \times 14 (= 140)$ or $5 \times 2 (= 10 \text{ (kg)})$ or $3 \div 2 (= 1.5 \text{ (boxes)})$	Accept values rounded or truncated to 1dp in both (a) and (b). Ignore units
		P1	for process using ratio of areas, eg $"140" \div "45" (= 3.1...)$ or for using ratio of amount of seed eg $"10" \div 3 (= 3.3...)$ or for finding coverage for 1 kg of grass seed, eg $"45" \div 3 (= 15 \text{ (m}^2\text{)})$	
		P1	for process to find amount of seed needed, eg $"140" \div "45" \times 3 (= 9.3... \text{ kg})$ or $"140" \div "45" \times "1.5" (= 4.6... \text{ (boxes)})$ or $"15" \times 2 (= 30 \text{ (m}^2 \text{ per box)})$ and $"140" \div "30" (= 4.6... \text{ (boxes)})$ or for process to find area that can be seeded, eg $"10" \div 3 \times "45" (= 150 \text{ (m}^2\text{)})$ or $"140" \div "10" (= 14 \text{ (m}^2\text{)})$ or	Accept 9.4 Accept 4.7
		C1	for "Yes" supported by correct figures eg 4.6...(and 5), or 9.3...and 10 or 150 and 140 (or 140 to 148.5) or 15 and 14	
(b)	Yes, (does not have enough) (supported)	C1	for reasoning supported with correct figures, eg does not have enough seed and compares 9 (kg) with 9.3...(kg) or 4.5 (boxes) with 4.6... (boxes) or 135 (m ²) with 140 (m ²) or 14 (m ²) with 15 (m ²) ft from (a)	Values used in (a) do not need repeating in (b) as long as intention is clear



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
17 (a)	42	P1	for a correct start to the process by finding the number of batches for one ingredient, eg $500 \div 125 (= 4)$ or $700 \div 200 (= 3.5 \text{ or } 3)$ or $250 \div 50 (= 5)$ OR for a correct start to building up number of batches of all ingredients, eg. (24 biscuits or 2 batches $\Rightarrow$) 250 (butter), 400 (flour) and 100 (sugar) OR for a start to the process by finding the amount of one ingredient needed to make 1 biscuit, eg $125 \div 12 (= 10 \frac{5}{12})$ or $200 \div 12 (= 16 \frac{8}{12})$ or $50 \div 12 (= 4 \frac{2}{12})$	
		P1	for a correct process to find the number of batches for all 3 ingredients, eg $500 \div 125 (= 4)$ and $700 \div 200 (= 3.5 \text{ or } 3)$ and $250 \div 50 (= 5)$ OR for a build-up process reaching a point where there is not enough of one ingredient, eg. (36 biscuits or 3 batches $\Rightarrow$) 375 (butter), 600 (flour) and 150 (sugar) or (48 biscuits or 4 batches $\Rightarrow$) 500 (butter), 800 (flour) and 200 (sugar) OR for a correct process to find the amount of each ingredient needed to make 1 biscuit, eg $125 \div 12 (= 10 \frac{5}{12})$ and $200 \div 12 (= 16 \frac{8}{12})$ and $50 \div 12 (= 4 \frac{2}{12})$	



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
(b)	Explanation	P1	(dep on P2) for a process to find the number of biscuits, eg $4 \times 12 (= 48)$ or $3.5 \times 12 (= 42)$ or $3 \times 12 (= 36)$ or $5 \times 12 (= 60)$ OR (dep on P2) for $(700 - 600) \div 200 \times 12 (= 6)$ or $3 \times 12 (= 36)$ OR (dep on P2) for a process to find the number of biscuits, eg $500 \div 10\frac{5}{12} (= 48)$ or $700 \div 16\frac{8}{12} (= 42)$ or $250 \div 4\frac{2}{12} (= 60)$	
		A1	cao	
		C1	(dep on P3) for a correct explanation, ft (a) for the critical ingredient identified Acceptable examples No, since flour is the critical value No, since flour gives you the least number of batches No since she needs more flour to make more biscuits. Not acceptable examples Yes ... No (no reason given) No, since we would need more of the other ingredients too	

Paper: 1MA1/3F					
Question	Answer	Mark	Mark scheme		Additional guidance
15	Yes (supported)	P1	for finding the cost of 1 kg of carrots eg $1.74 \div 3 (= 0.58)$	for finding the cost of 1 kg onions eg $2.00 \div 4 (= 0.5)$	for all P marks can work in pence or in £
		P1	for isolating the cost of 2.5 kg of onions eg $2.36 - (2 \times "0.58") (= 1.2(0))$	for finding the cost of 2.5 kg of onions eg $2.5 \times "0.5" (= 1.25)$	
		P1	for the cost of 1 kg of onions or 0.5 kg of onions, eg $"1.20" \div 2.5 (= 0.48)$ or $"1.20" \div 5 (= 0.24)$ or for $4 \div 2.5 (= 1.6)$	for finding the cost of 2 kg of carrots eg $2.36 - "1.25" (= 1.11)$	
		P1	for the cost of 4 kg of onions, eg $4 \times "0.48"$ or $8 \times "0.24" (= 1.92)$ or for $"1.6" \times "1.2(0)"$	for finding the cost of 3 kg of carrots eg $"1.11" \div 2 \times 3 (= 1.665)$ <i>for comparison with 1.74</i>	
		C1	Yes with correct figures shown eg 192 or 1.92 or "has 8p left" or 166.5		
					Allow comparison of mixed units eg 192 with £2

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
17	540	P1	for start of process, eg $350 + 250 (= 600)$ or $3 \times 380 (= 1140)$ or $380 - 350 (= 30)$ or $380 - 250 (= 130)$	350 + 250 + another number scores no marks eg 350 + 250 + 150 or 350 + 250 + 380
		P1	for process to work with mean and number of seats in at least one cinema, eg $350 + 250 (= 600)$ and $3 \times 380 (= 1140)$ or " 1140 " – 350 (= 790) or " 1140 " – 250 (= 890) or for an equation in x , eg $350 + 250 + x = 3 \times 380$ or $380 - 350 (= 30)$ and $380 - 250 (= 130)$	
		P1	for process to find number of seats in cinema C, eg " 1140 " – " 600 " or for $(x =)$ " 1140 " – 350 – 250 380 + " 30 " + " 130 "	
		A1	cao	
18 (a)	45	P1	for a valid start to the process, eg $180 \div 12 (= 15)$ or $3(.00) \div 12 (= 0.25)$	Calculations can be in £ or p or a combination for both process marks
		P1	for complete process, eg " 15 " $\times$ 3(.00) or $180 \times$ " 0.25 "	
		A1	for 45(.00)	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
18 (b)	9	P1 P1 A1	for a valid start to the process, eg cost of each can, eg $7(.00) \div 24 (= 0.2916\dots)$ or $700 \div 24 (= 29.16\dots)$ or total volume of 24 cans, eg $330 \times 24 (= 7920)$ or proportion of ml, eg $330 \div 100 (= 3.3)$ for complete process, eg $\frac{100}{330} \times "0.2916\dots" (= 0.08838\dots)$ or $\frac{100}{330} \times "29.16\dots" (= 8.838\dots)$ or $\frac{100}{7920} \times 7(.00) (= 0.08838\dots)$ or $7(.00) \div 24 \div \frac{330}{100} (= 0.08838\dots)$ or $7(.00) \div \frac{7920}{100} (= 0.08838\dots)$	Calculations can be in £ or p Accept £0.09(p)
19 (a)	45 150 90 65 25	B3 (B2) (B1)	for a fully correct frequency tree for at least 4 figures correctly placed for at least 1 figure correctly placed	If probabilities used instead of frequencies award a maximum of B2
(b)	30	M1 A1	for eg $\frac{45}{150}$ oe or $45 \div 150 (= 0.3)$ or for $\frac{[\text{number of car owners who own a bicycle}]}{[\text{total number of people who own a car}]}$ ft diagram oe	Must be values from their diagram with numerator < denominator

