Study: O & A Level

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Subject	Maths A (4MA1)	Topics	Numbers
Student's Name		Institution	
Grade		Phone	

Q1. Show that

$$4\frac{2}{3} + 3\frac{4}{5} = 8\frac{7}{15}$$

(Total for question = 3 marks)

(Q03 4MA1/2H, Jan 2020)

Q2. The diagram shows a shape.

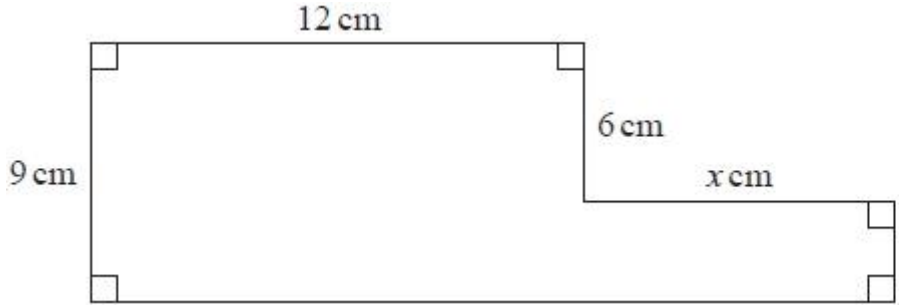


Diagram **NOT** accurately drawn

The shape has area 129 cm^2

Work out the value of x.

$x =$ .....

(Total for question = 4 marks)

(Q03 4MA1/1H, Jan 2020)

Q3. Jenny invests $8500 for 3 years in a savings account. She gets 2.3% per year compound interest.

(a) How much money will Jenny have in her savings account at the end of 3 years?

Give your answer correct to the nearest dollar.

$

(3)

Rami bought a house on 1st January 2015. In 2015, the house increased in value by 15%. In 2016, the house decreased in value by 8%. On 1st January 2017, the value of the house was $687 700.

(b) What was the value of the house on 1st January 2015?

……$(3)

(Total for question = 6 marks)
(Q07 4MA1/2H, Jan 2019)

Q4. Max invests $6000 in a savings account for 3 years. The account pays compound interest at a rate of 1.5% per year for the first 2 years.

The compound interest rate changes for the third year. At the end of 3 years, there is a total of $6311.16 in the account.

Work out the compound interest rate for the third year.
Give your answer correct to 1 decimal place.

…… %

(Total for question = 3 marks)
(Q11 4MA1/1H, Jan 2020)

Q5. Jan invests \$8000 in a savings account. The account pays compound interest at a rate of x % per year. At the end of 6 years, there is a total of \$8877.62 in the account.

Work out the value of x.
Give your answer correct to 2 decimal places.

$x =$ .....

(Total for question = 3 marks)
(**Q13 4MA1/1H, Nov 2020**)

Q6. Himari invests 200 000 yen for 3 years in a savings account paying compound interest. The rate of interest is 1.8% for the first year and x% for each of the second year and the third year. The value of the investment at the end of the third year is 209 754 yen.

Work out the value of x. Give your answer correct to one decimal place.

$x =$ .....

(Total for question = 3 marks)

(**Q11 4MA1/1H, Jan 2022**)

Q7. Shane invests 7200 dollars for 3 years in a savings account. He gets 2.5% per year compound interest.

How much money will Shane have in his savings account at the end of 3 years? Give your answer to the nearest dollar.

..... dollars

(Total for question = 3 marks)

(**Q05 4MA1/2HR, Jan 2022**)

Q8. Kazi buys a car for 700 000 taka. The value of the car depreciates by 12% each year.

Work out the value of the car at the end of 3 years. Give your answer correct to the nearest taka.

..... taka

(Total for question = 3 marks)

(**QU09 4MA1/1HR, June 2023**)

Q9. Feruzi invests 80 000 Kenyan shillings (KES). He invests the money for 3 years at x% compound interest each year. At the end of 3 years, the total interest he receives is 6151.25 KES.

Work out the value of x

$x =$ .....

(Total for question = 3 marks)
(**QU13 4MA1/2HR, June 2023**)

Q10. Chen invests 40 000 Yuan in a fixed term bond for 3 years. The fixed term bond pays compound interest at a rate of 3.5% each year.

(a) Work out the value of Chen's investment at the end of 3 years. Give your answer to the nearest Yuan.

..... Yuan

(3)

Wang invested P Yuan. The value of his investment decreased by 6.5% each year. At the end of the first year, the value of Wang's investment was 30 481 Yuan.

(b) Work out the value of P.

$P =$ .....

(3)

(Total for question = 6 marks)
(**Q07 4MA1/1H, Jan 2021**)

Q11. Teresa invests \$2000 for 3 years in a savings account. She gets 4% each year compound interest.

(a) How much money will Teresa have in her savings account at the end of 3 years?

Give your answer correct to the nearest dollar.

\$.....

(3)

Sam invested \$ *T*. The value of his investment decreased by 9% each year. At the end of the first year, the value of Sam's investment was \$1365

(b) Work out the value of *T*

.....

(3)

(Total for question = 6 marks)

(**Q09 4MA1/2HR, Jan 2023**)

Q12. Ali and Badia each have 25 000 dollars to invest.

Cyclone Bank	Tornado Bank
Invest 25 000 dollars 4.5% compound interest per year for 3 years	Invest 25 000 dollars Receive 1150 dollars interest each year for 3 years

Ali invests in the Cyclone Bank for 3 years.
Badia invests in the Tornado Bank for 3 years.

By the end of the 3 years, Ali will have received more interest than Badia.

How much more? Show your working clearly.
Give your answer correct to the nearest dollar.

..... dollars

(Total for question = 4 marks)

(**Q07 4MA1/2H, Nov 2021**)

Q13. Jonty has a storage container in the shape of a cuboid, as shown in the diagram.

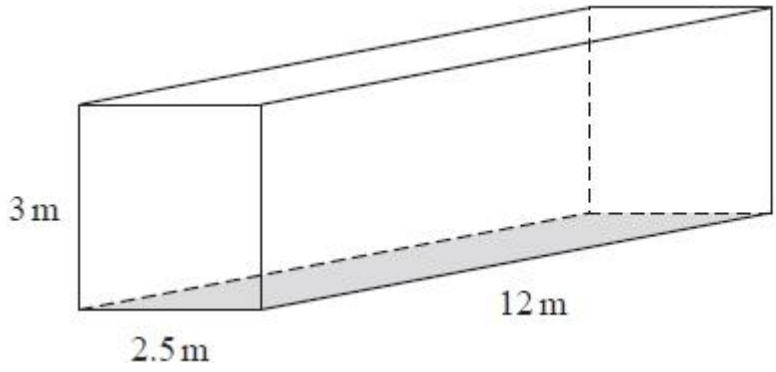


Diagram **NOT** accurately drawn

Jonty is going to paint the outside of his storage container, apart from the base which is shown shaded in the diagram. He needs enough paint to cover the four sides and the top. Each tin of paint covers an area of 15 m^2.

The cost of each tin of paint recently increased by 10%. After the increase, the cost of each tin of paint is £26.95.

Jonty says "Before the increase, I could have bought enough paint for less than £200"

Show that Jonty is correct. Show your working clearly.

(Total for question = 6 marks)

(**Q10 4MA1/1HR, Jan 2022**)

Q14. The diagram shows a solid cuboid made from wood.

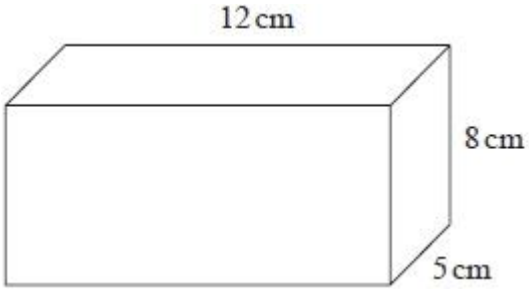


Diagram **NOT** accurately drawn

The wood has density 0.7 g/cm^3. Work out the mass of the cuboid.

..... grams

(Total for question = 3 marks)

(**Q06 4MA1/1H, June 2019**)

Q15. On 1st January 2016 Li bought a boat for \$170 000. The value of the boat depreciates by 8% per year.
Work out the value of the boat on 1st January 2019. Give your answer correct to the nearest dollar.

\$ .....

(Total for question = 3 marks)

(**Q08 4MA1/1H, June 2019**)

Q16. Jane bought a new car for \$18 000. The car depreciates in value by 15% each year.

Work out the value of the car at the end of 4 years. Give your answer correct to the nearest \$

\$ .....

(Total for question = 3 marks)

(**QU08 4MA1/1HR, June 2022**)

Q17.

(a) Factorise fully $25a^4c^7d + 45a^9c^3h$

.....

(2)

(b) Solve $(2x + 5)^2 = (2x + 3)(2x - 1)$

$x =$ .....

(3)

(Total for question = 5 marks)

(**Q09 4MA1/1H, June 2021**)

Q18.

(a) Factorise fully $18c^3d^2 - 21c^2$

.....

(2)

(b) (i) Factorise $y^2 - 3y - 18$

.....

(2)

(ii) Hence, solve $y^2 - 3y - 18 = 0$

.....

(1)

(Total for question = 5 marks)

(**Q08 4MA1/1HR, Jan 2023**)

Q19. Sarah makes and sells mugs. One day she makes 150 mugs. Her total cost for making these mugs is £1140. Of these mugs, 2/5 is small mugs, 32% are medium mugs and the rest are large mugs. Here is Sarah's price list for selling each mug.

MUGS	
Small	£8.50
Medium	£11.20
Large	£14.20

Sarah sells all 150 mugs.

Work out her percentage profit.
Give your answer correct to the nearest whole number.

..... %

(Total for question = 5 marks)

(**Q04 4MA1/1H, Jan 2022**)

Q20. Mary saves for a holiday each year. In 2020 she saved a total of \$720. In 2021, each month she saved \$78. The total amount Mary saved in 2021 was P% more than the total she saved in 2020

(a) Work out the value of P

.....

(4)

Roberto is going to go on holiday. He has two coupons that will save him money on his holiday.

Coupon A	**Coupon B**
18% off the cost of the accommodation	12.5% off the total cost of the accommodation **and** the flights

For Roberto's holiday, the cost of the accommodation is \$1600, the cost of the flights is \$800. Roberto can only use one of the coupons. He wants to save as much money as he can.

(b) Which of the two coupons, **A** or **B**, should he use?
Show your working clearly.

(3)

(Total for question = 7 marks)

(**Q02 4MA1/2HR, Jan 2022**)

Q21. Matteo is going to invest 5000 Swiss francs for two years. He can invest his money in Bank **G** or in Bank **H**.

Bank **G**	Bank **H**
1.6% per year compound interest	2.9% interest added after two years

The total amount of interest Matteo would receive at the end of two years from Bank **G** is more than the amount of interest Matteo would receive at the end of two years from Bank **H**. How much more?

..... Swiss francs

(Total for question = 4 marks)

(**Q08 4MA1/2H, Jan 2023**)

Q22. The frequency table gives information about the numbers of mice in some nests.

Number of mice	Frequency
5	4
6	13
7	16
8	x
9	6

The mean number of mice in a nest is 7. Work out the value of x.

$x =$ .....

(Total for question = 4 marks)

(**Q13 4MA1/2H, Jan 2019**)

Q23. Sandeep wants to buy some packets of pens and some boxes of pencils for his stationery shop. Each packet of pens contains 9 pens. Each box of pencils contains 12 pencils. Each packet of pens costs £7.60. Each box of pencils costs £4.80

Sandeep can only buy full packets of pens and full boxes of pencils. He wants to buy exactly the same number of pens as pencils.

Work out the minimum amount Sandeep needs to pay.

£ .....

(Total for question = 4 marks)
(**QU02 4MA1/2HR, June 2023**)

Q24. Antoine is going on holiday. He makes 3 separate payments to cover the total cost of his holiday. The following table shows how much money Antoine pays to the holiday company.

Payment	Amount paid
Payment 1	$\frac{3}{8}$ of the total cost
Payment 2	45% of the total cost
Payment 3	$406

Work out how much Antoine has to pay for Payment 2

$.....

(Total for question = 5 marks)
(**QU13 4MA1/1H, June 2022**)

Q25. Pasha invests 50 000 dollars in a savings account for 4 years. He gets 1.3% per year compound interest. Work out how much money Pasha will have in his savings account at the end of 4 years.

Give your answer correct to the nearest dollar.

..... dollars

(Total for question = 3 marks)
(**QU09 4MA1/2H, June 2022**)

Q26.

The table shows the cost, in euros, of Brigitte's car insurance in each of the years 2016, 2017 and 2018.

Year	2016	2017	2018
Cost of insurance (euros)	500	545	592

Brigitte says,

"The percentage increase in the cost of my car insurance from 2017 to 2018 is more than the percentage increase in the cost of my car insurance from 2016 to 2017"

(a) Is Brigitte correct?
You must show how you get your answer.

(4)

Henri wants to insure his car. He gets a discount of 15% off the normal price. Henri pays 952 euros for his car insurance after the discount.

(b) Work out the discount that Henri gets.

..... euros

(3)

(Total for question = 7 marks)

(**Q08 4MA1/2H, Jan 2020**)

Q27. Divya and Yuan each pay for a holiday at a special offer price.

Divya's holiday
Normal price: \$1600
Special offer: 16% off the normal price

Yuan's holiday
Normal price: \$1400
Special offer: k% off the normal price

The amount that Divya pays is the same as the amount that Yuan pays.

Work out the value of k

$k =$ .....

(Total for question = 4 marks)

(**Q04 4MA1/1HR, Jan 2023**)

Q28. The table gives information about the price of gold.

	1st February 2016	1st March 2016
Price of one ounce of gold (dollars)	1126.50	1236.50

(a) Work out the percentage increase in the price of gold between 1st February 2016 and 1st March 2016

Give your answer correct to 3 significant figures.

%

(3)

The price of one ounce of gold on 1st February 2016 was 1126.50 dollars.
The price of gold increased by 19% from 1st February 2016 to 1st July 2016

(b) Work out the price of one ounce of gold on 1st July 2016

Give your answer correct to the nearest dollar.

dollars

(3)

(Total for question = 6 marks)
(Q04 4MA1/1H, Jan 2019)

Q29. Josh buys and sells books for a living. He buys 120 books for £4 each. He sells $\frac{1}{2}$ of the books for £5 each. He sells 40% of the books for £7 each. He sells the rest of the books for £8 each.

(a) Calculate Josh's percentage profit.

..... %

(5)

One book that Josh owns had a value of £15 on the 1st May 2019. The value of this book had increased by 20% in the last year.

(b) Find the value of the book on the 1st May 2018

£ .....

(3)

(Total for question = 8 marks)

(**Q05 4MA1/2H, June 2019**)

Q30. Himari's annual salary is 3 130 000 Japanese Yen (JPY). She gets a salary increase of 4%

(a) Work out Himari's salary after this increase.

..... JPY

(3)

Kaito bought a car. The value of the car when Kaito bought it was 750 000 JPY. At the end of each year, the value of his car had depreciated by 15%

(b) Work out the value of Kaito's car at the end of 3 years.

Give your answer correct to the nearest JPY.

..... JPY

(3)

(Total for question = 6 marks)

(**Q05 4MA1/2H, Nov 2020**)

Q31. Gladys buys a table for \$465 to sell in her shop. She sells the table for \$520.

(a) Work out the percentage profit that Gladys makes from the sale of the table.
Give your answer correct to 3 significant figures.

..... %

(3)

Gladys has a sale in her shop. She decreases all the normal prices by 12%. The normal price of an armchair was \$550.

(b) Work out the sale price of the armchair.

\$ .....

(3)

(Total for question = 6 marks)

(**Q03 4MA1/2H, Jan 2021**)

Q32. Chengbo sold a house for 180 000 yuan. The amount for which he sold the house is 24% more than the amount he paid for the house.

(a) Work out how much Chengbo paid for the house.
Give your answer correct to 3 significant figures.

..... yuan

(3)

Zhi bought a house on 1st January 2017. When she bought the house, its value was 120 000 yuan. The value of the house increased by 1.8% per year.

(b) Work out the value of Zhi's house on 1st January 2020
Give your answer correct to 3 significant figures.

..... yuan

(3)

(Total for question = 6 marks)

(**Q11 4MA1/2H, June 2021**)

Q33. Shane bought a car. The amount Shane paid for the car was \$32 000. Theresa also bought a car. To pay for this car, Theresa paid a deposit of \$18 000 together with 14 monthly payments of \$1160. Theresa paid more for her car than Shane paid for his car.

(a) Work out how much more Theresa paid as a percentage of the amount Shane paid.

..... %

(4)

Kylie bought a van. After 1 year, the value of the van was \$39 865. During this year, the value of the van decreased by 15%

(b) Work out the value of the van when Kylie bought it.

\$ .....

(3)

(Total for question = 7 marks)

(**Q06 4MA1/1H, Jan 2023**)

Q34. In his previous job, Pierre was paid 400 euros in total for working a 5-day week. In his new job, Pierre is paid 14 euros per hour. In his new job, Pierre works for 7 hours each day for a 5-day week.

(a) Work out the percentage increase in the amount that Pierre is paid for a 5-day week.

..... %

(4)

Marie changes her job. Her salary decreases by 6%. Her new salary is 23 030 euros.

(b) Work out Marie's salary before she changes her job.

..... euros

(3)

(Total for question = 7 marks)

(**QU06 4MA1/2HR, June 2023**)

Q35.

A field is in the shape of a trapezium.

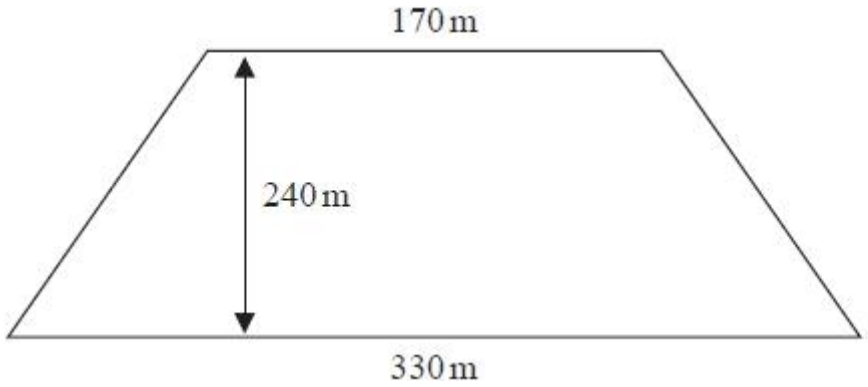


Diagram **NOT** accurately drawn

The field is sold for a price of \$49 650. Given that, 1 hectare = 10 000 m^2. Work out the average price of the field per hectare.

\$ .....

(Total for question = 4 marks)
(**QU05 4MA1/2HR, June 2023**)

Q36. A cinema increased the cost of an adult ticket by 12%. After the increase, the cost of an adult ticket was £18.20.

Work out the cost of an adult ticket before the increase.

£ .....

(Total for question = 3 marks)
(**QU08 4MA1/2HR, June 2022**)

Q37. Mario is going to save \$50 in the year 2021. He is going to continue to save, up to and including the year 2070, by increasing the amount he saves each year by \$$k$. Mario will save a total of \$33 125 from 2021 to 2070

Work out the value of k.

$k =$ .....

(Total for question = 3 marks)
(**Q25 4MA1/2H, Jan 2020**)

Q38. $\mathscr{E}$ = 20, 21, 22, 23, 24, 25, 26, 27, 28, 29

A = odd numbers

B = multiples of 3

List the members of the set

(i) $A \cap B$

.....

(1)

(ii) $A \cup B$

.....

(1)

(Total for question = 2 marks)
(**Q04 4MA1/1H, Jan 2021**)

Q39. $\mathscr{E}$ = positive integers less than 20
$A = x : x < 12$
$B = x : 7 \leq x < 16$

(a) List the members of A ∩ B

.....

(2)

C is a set such that $C \subset A$ and $n(C) = 3$. Given that all members of C are even numbers,

(b) list the members of one possible set C.

.....

(1)

(Total for question = 3 marks)
(Q14 4MA1/1H, June 2019)

Q40. $\mathscr{E}$ = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
A = 2, 3, 5, 7
B = 4, 6, 8, 10

(a) Explain why A ∩ B = ∅

.....

.....

(1)

$x \in \mathscr{E}$ and $x \notin A \cup B$

(b) Write down the **two** possible values of x.

..... , ...

(1)

Set C is such that

$A \cup B \cup C = \mathscr{E}$
$A \cap C = 2$
$B \cap C' = 4, 6, 10$

(c) List all the members of set C.

.....

(2)

(Total for question = 4 marks)
(Q03 4MA1/2H, June 2019)

Q41. $\mathscr{E} = 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20$
$A =$ multiples of 3
$B =$ odd numbers

(a) List the members of the set

(i) $A \cap B$

.....

(1)

(ii) $A \cup B$

.....

(1)

(b) Is it true that $24 \in A$?

Tick one of the boxes below.

Yes ☐ No ☐

Give a reason for your answer.

.....

.....

(1)

Set C has 4 members such that $C \cap B' = 10, 18$

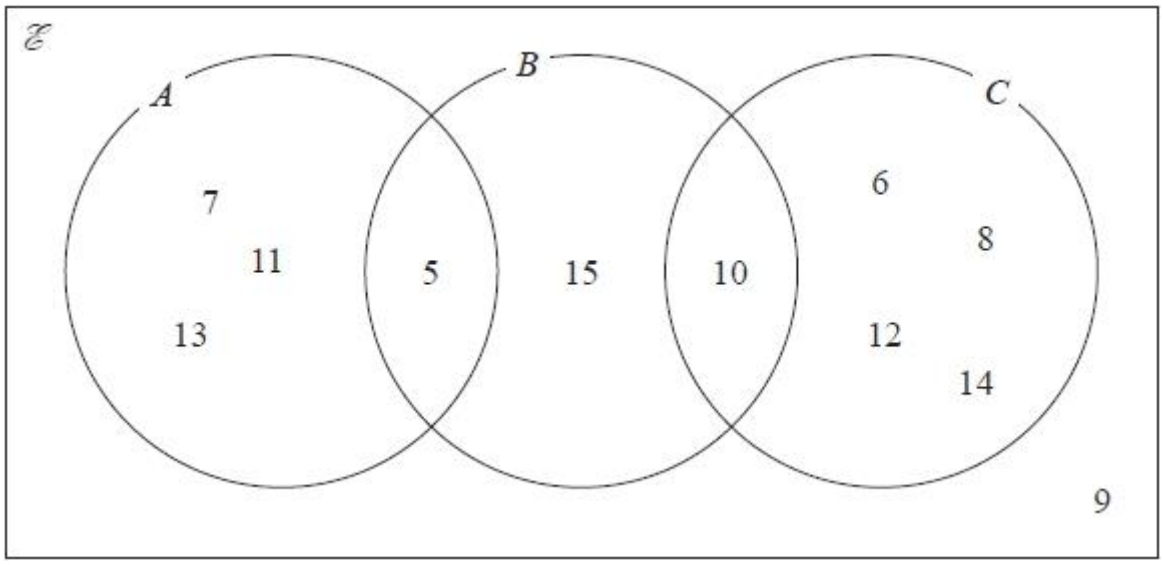
(c) List the members of one possible set C

.....

(2)

(Total for question = 5 marks)
(QU04 4MA1/2HR, June 2022)

Q42. Here is a Venn diagram.



(a) Write down the numbers that are in the set

(i) A

.....

(1)

(ii) $B \cup C$

.....

(1)

Dominic writes down $9 \notin C$

(b) Explain why Dominic is correct.

.....

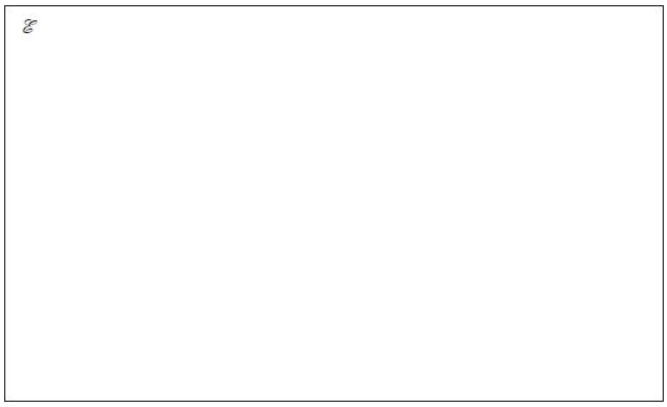
.....

(1)

(Total for question = 3 marks)
(QU02 4MA1/1HR, June 2023)

Q43. $\mathscr{E} = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12$
$A =$ odd numbers
$A \cap B = 1, 3$
$A \cup B = 1, 2, 3, 4, 5, 6, 7, 9, 11, 12$

Draw a Venn diagram to show this information.



(Total for question = 4 marks)
(Q04 4MA1/2H, Jan 2019)

Q44.

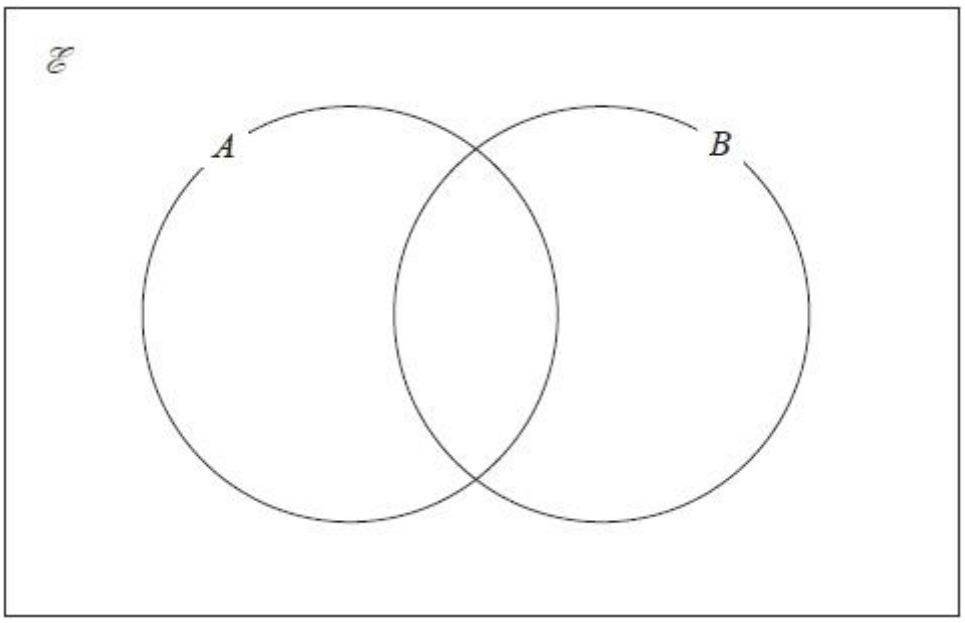
$\mathscr{E} = \{4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15\}$

$A \cap B = \{5, 10, 15\}$

$B' = \{7, 8, 9, 11, 12, 13, 14\}$

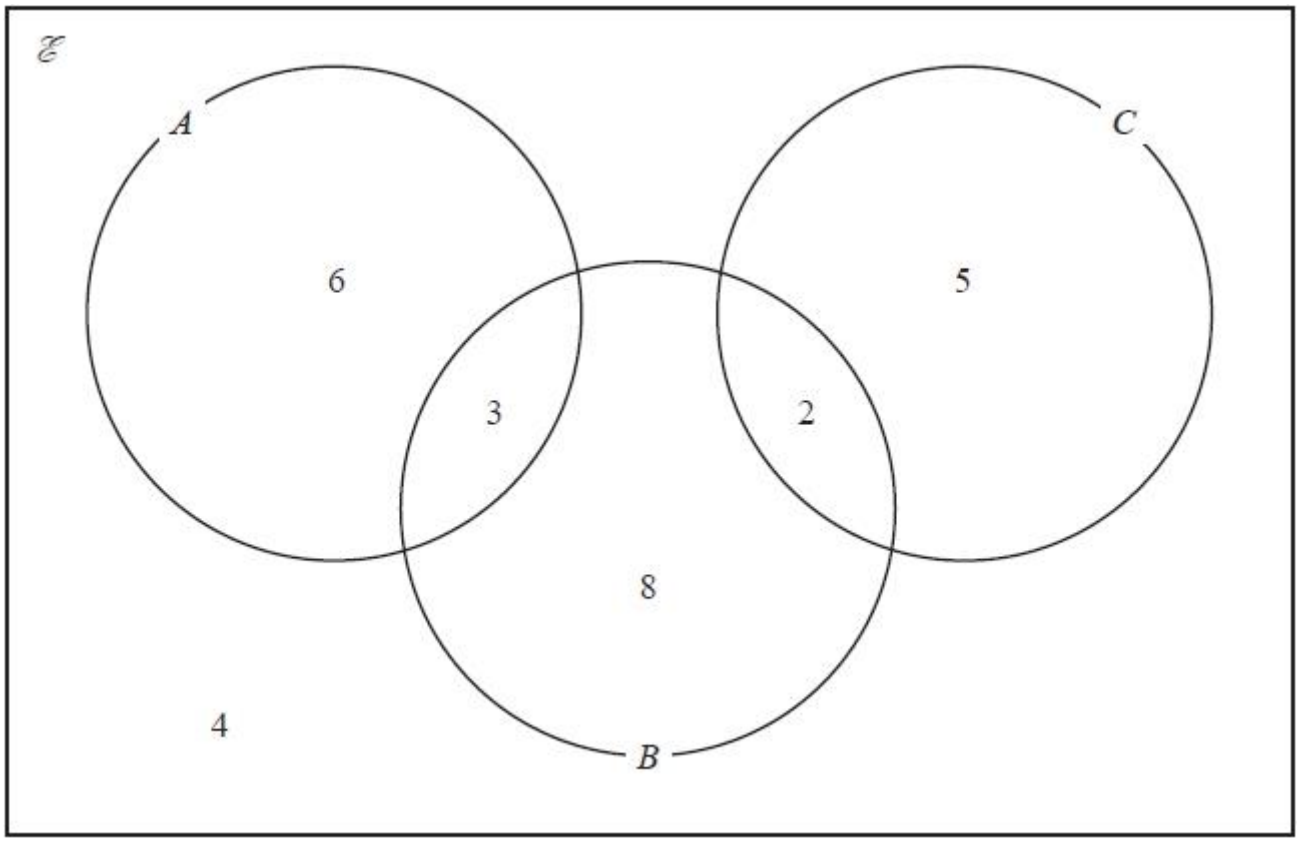
$A' = \{4, 6, 7, 8, 14\}$

Complete the Venn diagram for this information.



(Total for question = 3 marks)
(Q07 4MA1/1H, Jan 2022)

Q45. The Venn diagram shows a universal set $\mathscr{E}$ and three sets A, B and C.



6, 3, 8, 2, 5 and 4 represent the **numbers** of elements.

Find

(i) $n(A \cup B)$

.....

(1)

(ii) $n(A \cap C)$

.....

(1)

(iii) $n(B \cap C)$

.....

(1)

(iv) $n(A' \cup B' \cup C)$

.....

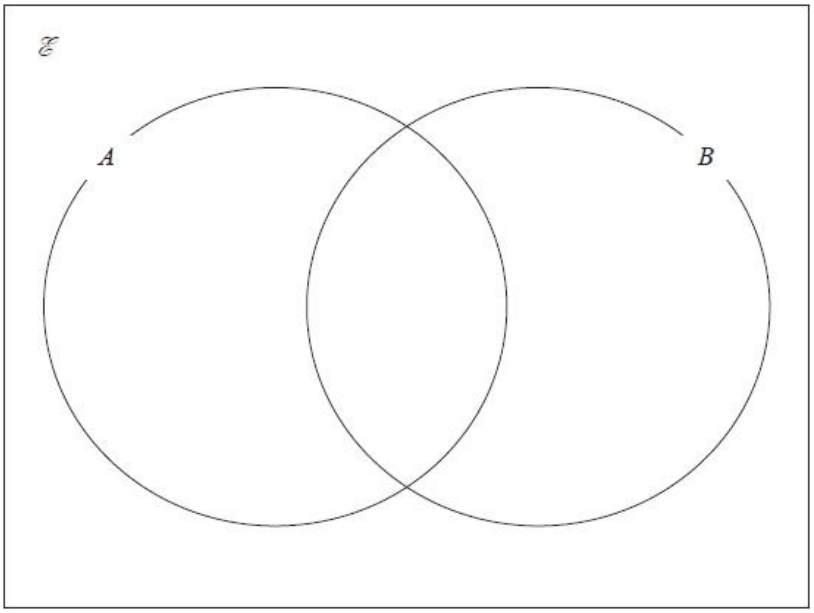
(1)

(Total for question = 4 marks)
(Q17 4MA1/1HR, Jan 2022)

Q46. $\mathscr{E} = 11, 12, 13, 14, 15, 16, 17, 18, 19, 20$

$A =$ even numbers
$A \cap B = 12, 16, 20$
$(A \cup B)' = 17, 19$

Complete the Venn diagram for the sets $\mathscr{E}$, A and B



(Total for question = 3 marks)
(Q03 4MA1/2H, Jan 2023)

Q47. A, B and C are three sets.

$n(A \cap B \cap C) = 5$

$n(A \cap B \cap C') = 2$

$n(A \cap C) = 5$

$n(A) = 17$

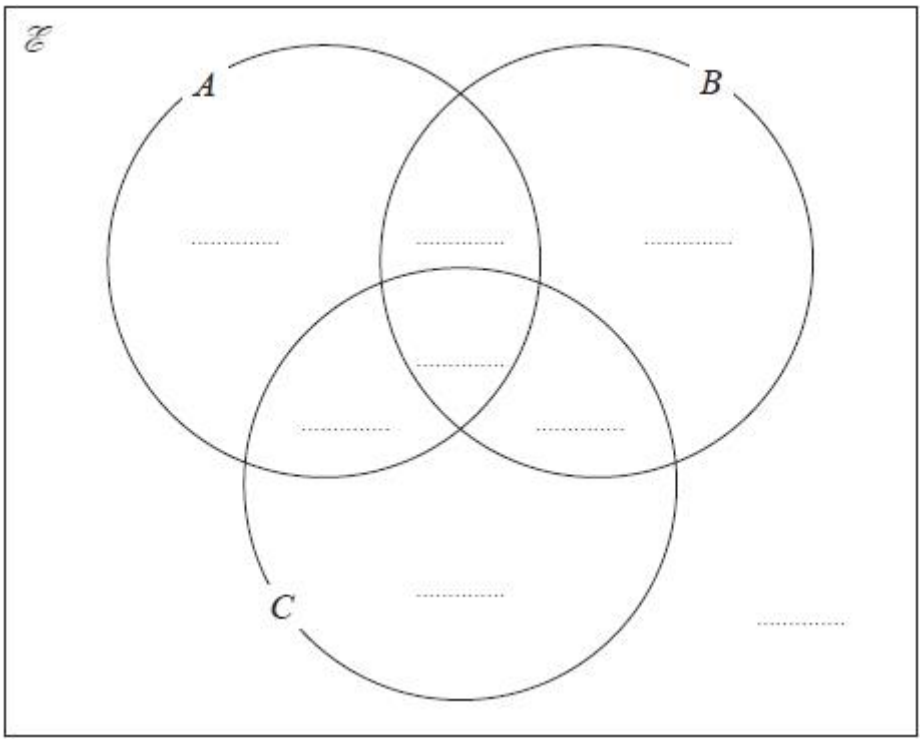
$n([A \cup B \cup C]') = 3$

$n(A' \cap B \cap C') = 6$

$n(B \cap C) = 7$

$n(C) = 14$

Complete the Venn diagram to show the number of elements in each region.



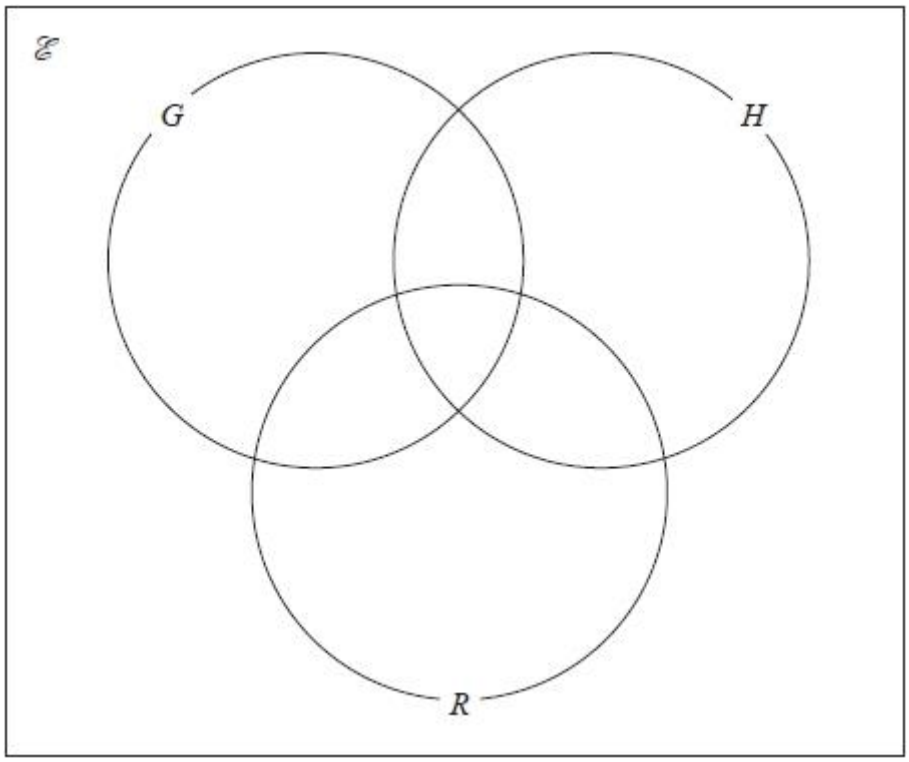
(Total for question = 4 marks)
(Q20 4MA1/2HR, Jan 2023)

Q48. All the students in Year 11 at a school must study at least one of Geography (G), History (H) and Religious Studies (R). In Year 11 there are 65 students.

Of these students

15 study Geography, History and Religious Studies
21 study Geography and History
16 study Geography and Religious Studies
30 study Geography
18 study only Religious Studies
37 study Religious Studies

(a) Using this information, complete the Venn diagram to show the number of students in each region of the Venn diagram.



(3)

A student in Year 11 who studies both History and Religious Studies is chosen at random.

(b) Work out the probability that this student does **not** study Geography.

(2)

(Total for question = 5 marks)
(Q13 4MA1/1H, Jan 2019)

Study: O & A Level

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Subject	Maths A (4MA1)	Topics	Numbers (Mark Scheme)
Student's Name		Institution	
Grade		Phone	

Q1.

Question	Working	Answer	Mark	Notes
	$\frac{14}{3}(+)\frac{19}{5}$ or $(4)\frac{10}{15}(+)(3)\frac{12}{15}$ or $(4)\frac{10a}{15a}(+)(3)\frac{12a}{15a}$		3	M1 for correct improper fractions or fractional part of numbers written correctly over a common denominator
	eg $\frac{14\times5+19\times3}{3\times5}$ or $\frac{70}{15}+\frac{57}{15}$ or $\frac{70a}{15a}+\frac{57a}{15a}$ or $4\frac{10}{15}+3\frac{12}{15}=7\frac{22}{15}$ oe			M1 for correct fractions with a common denominator of 15 or a multiple of 15
	$\frac{70}{15}+\frac{57}{15}=\frac{127}{15}=8\frac{7}{15}$ or $7\frac{22}{15}=8\frac{7}{15}$ or if shows $8\frac{7}{15}=\frac{127}{15}$ at the beginning then show that the addition comes to $\frac{127}{15}$	Shown		A1 dep on M2 for a correct answer from fully correct working **or** shows that RHS = $\frac{127}{15}$ **and** fully correct working shows LHS = $\frac{127}{15}$
				Total 3 marks

(**Q03 4MA1/2H, Jan 2020**)

Q2.

Question		Working	Answer	Mark	Notes
		E.g. 12×9 (=108) **or** $(9-6) \times x$ (= $3x$)		4	M1 for one correct relevant area
		E.g. 129 – '108' (= 21) **or** '108' + '$3x$' = 129			M1 (dep on M1) for 129 used correctly with another area **or** for a correct equation (ft) with bracket(s) expanded
		E.g. '21' ÷ (9 – 6) **or** $x = \frac{129-'108'}{9-6}$			M1 for a complete method
			7		A1 Accept 7 cm
					Total 4 marks

(**Q03 4MA1/1H, Jan 2020**)

Q3.

Question	Working	Answer	Mark	Notes		
(a)	8500 × 0.023 (=195.5) **or** 8500 × 1.023 (=8695.5)			M1		M2 for 8500×1.023^3
	((8500 + "195.5") × 1.023) × 1.023			M1	complete method	(M1 for 8500×1.023^n)
		9100	3	A1	for 9100 – 9100.1 (answer for 600(.1) gains M2A0)	
(b)	687 700 ÷ 0.92 (=747 500) **or** 687 700 ÷ 1.15 (=598 000) **or** 1.15 × 0.92 (=1.058)			M1	a correct first step	
	687 7000 ÷ (0.92 × 1.15)			M1	Dep on M1 for completely correct method	
		650 000	3	A1		

(**Q07 4MA1/2H, Jan 2019**)

Q4.

Question		Working	Answer	Mark	Notes
		6000×1.015^2 (= 6181.35) **or** 6000 + (0.015 × 6000) + (0.015 × (6000 + '90')) (= 6181.35) **or** $(1.015)^2$ (= 1.030225) **or** $\frac{6311.16}{6000}(=1.05186)$		3	M1 for working out the total amount after **two** years **or** working out the compound interest multiplier after two years **or** working out the compound interest multiplier after three years
		6311.16 ÷ '6181.35' (= 1.021) (×100) **or** $\frac{6311.16-'6181.35'}{'6181.35'}(=1.021)$ (×100) **or** '1.05186' ÷ '1.030225' (= 1.021) (×100)			M1 (dep on M1) for a complete method to find the compound interest multiplier (×100)
			2.1		A1 awrt 2.1
					Total 3 marks

(**Q11 4MA1/1H, Jan 2020**)

Q5.

Q	Working	Answer	Mark	Notes
	$8000\times\left(\frac{100+x}{100}\right)^6=8877.62$ oe **or** $8000\times\left(1+\frac{x}{100}\right)^6=8877.62$ oe **or** $8000\times(1+x\%)^6=8877.62$ **or** $8000\times y^6=8877.62$ oe		3	M1
	$\left(\frac{8877.62}{8000}\right)^{\frac{1}{6}}$ (=1.0175…) **or** $(1.1097...)^{\frac{1}{6}}$ (=1.0175…)			M1
		1.75		A1
				Total 3 marks

(**Q13 4MA1/1H, Nov 2020**)

Q6.

Q	Working	Answer	Mark	Notes	
	eg 200 000 × 0.018 (= 3600) **or** 200 000 × 1.018 (= 203 600)		3	M1	for method to find 1.8% or 101.8% of 200 000
	eg $\sqrt{209\ 754 \div \text{“}203\ 600\text{”}}$ (= 1.015000…)			M1	for a complete method to find the multiplier for the compound interest for 2nd and 3rd year
		1.5		A1	or better eg 1.500045971…
					Total 3 marks

(**Q11 4MA1/1H, Jan 2022**)

Q7.

Q	Working	Answer	Mark	Notes	
	7200 × 0.025 (= 180) or 7200 × 1.025 (= 7380) oe or 7200 × 1.075 (= 7740) oe or 7200 × 0.075 (= 540) oe		3	M1	M2 for 7200 × $(1.025)^3$
	(7200 + '180') × 0.025 (= 184.5) and (7200 + '180' + '184.5') × 0.025 (= 189.1125) and 7200 + '180' + '184.5' + '189.1…' (= 7753.6125)			M1 NB year end values are 7380 and 7564.5(0) 7753.6125	
		7754		A1 answer in range 7753 – 7754	
					Total 3 marks

(**Q05 4MA1/2HR, Jan 2022**)

Q8.

	0.12 × 700 000 oe (= 84 000) **or** 0.88 × 700 000 oe (= 616 000) **or** 700 000 × 0.88^2 oe (= 542 080)		3	M1	for finding 12% **or** 88% of 700 000	M2 for 700 000 × 0.88^3 **or** 700 000 × 0.88^4 (= 419 786.75)
	0.88 × "616 000" oe (= 542 080) **and** 0.88 × "542 080" oe (= 477 030.4)			M1	for completing method to find the value of the car	
	Correct answer scores full marks (unless from obvious incorrect working)	477 030		A1	accept 477 030 – 477 031	
					SC: if no other marks gained award M1 for 0.36 × 700 000 oe **or** 252 000 **or** 0.64 × 700 000 oe **or** 448 000 accept (1 − 0.12) as equivalent to 0.88 throughout	
						Total 3 marks

(**QU09 4MA1/1HR, June 2023**)

Q9.

	$80\,000\times\left(\frac{100+x}{100}\right)^3 = 80\,000+6151.25$ oe **or** $80\,000\times\left(1+\frac{x}{100}\right)^3 = 80\,000+6151.25$ oe **or** $80\,000\times(1+x\%)^3 = 80\,000+6151.25$ oe **or** $80\,000\times y^3 = 80\,000+6151.25$ oe **or** $\frac{80\,000+6151.25}{80\,000}(=1.076\ldots)$ oe **or** $\frac{86151.25}{80\,000}(=1.076\ldots)$ oe		5	M1
	$\sqrt[3]{\frac{80\,000+6151.25}{80\,000}}(=1.025)$ oe **or** $\sqrt[3]{1.076\ldots}(=1.025)$ **or** $\left(1+\frac{x}{100}\right)^{41}=\frac{}{40}(=1.025)$			M1
	Correct answer scores full marks (unless from obvious incorrect working)	2.5		A1 Accept answers in the range 2.4 – 2.6 from correct working NB Do not allow an answer in the range 2.4 – 2.6 if it comes from awrt 7.6% oe or 7.7% oe divided by 3 Do not accept an answer if it is in the range that comes from a simple interest method
				Total 3 marks

(**QU13 4MA1/2HR, June 2023**)

Q10.

Q	Working	Answer	Mark	Notes	
(a)	for $0.035\times 40\,000$ oe (= 1400) **or** $1.035\times 40\,000$ oe (= 41 400)		3	M1 for finding 3.5% **or** 103.5% of 40 000	**OR** M2 for $40\,000\times 1.035^3$ **or** $40\,000\times 1.035^4$ (= 45 900.92) (M1 for $40\,000\times 1.035^2$ (= 42 849))
	"41 400" × 1.035 oe (= 42 849) "42 849" × 1.035 oe (= 44 348.72) **OR** $40\,000\times 1.035^3$			M1 for completing method to find total amount in the account	
		44 349		A1 accept 44 348 – 44 349	
				SC: if no other marks gained award M1 for $0.105\times 40\,000$ oe **or** 4200 **or** 44 200 accept (1 + 0.035) as equivalent to 1.035 throughout	
(b)	e.g. $30\,481\div(1-0.065)$ **or** $30\,481\div 0.935$		3	M2 for a complete method (M1) for $30\,481\div(100-6.5)$ (= 326) **or** (100 – 6.5)% = 30 481 **or** 93.5% = 30 481 **or** e.g. $(1-0.065)x = 30\,481$	
		32 600		A1	
				Total 6 marks	

(**Q07 4MA1/1H, Jan 2021**)

Q11.

Q	Working		Answer	Mark	Notes	
(a)	for 0.04×2000 oe (= 80) **or** 1.04×2000 oe (= 2080)	**OR**		3	M1 for finding 4% **or** 104% of 2000	**OR** M2 for 2000×1.04^3 oe **or** 2000×1.04^4 oe (= 2339.72)
	$1.04 \times$ "2080" oe (= 2163.2) $1.04 \times$ "2163.2" oe	2000×1.04^3 oe			M1 for completing method to find total amount in the account at the end of 3 years	
	Correct answer scores full marks (unless from obvious incorrect working)		2250		A1 accept 2249 – 2250	
					SC: if no other marks gained award M1 for 0.12×2000 oe **or** 240 **or** 1.12×2000 oe **or** 2240 accept (1 + 0.04) as equivalent to 1.04 throughout	
(b)	eg $1365 \div (1 - 0.09)$ **or** $1365 \div 0.91$			3	M2 for a complete method (M1) for $1365 \div (100 - 9)$ (= 15) **or** $(100 - 9)\% = 1365$ **or** $91\% = 1365$ **or** eg $(1 - 0.09)T = 1365$ **or** eg $T - 0.09T = 1365$	
	Correct answer scores full marks (unless from obvious incorrect working)		1500		A1	
						Total 6 marks

(**Q09 4MA1/2HR, Jan 2023**)

Q12.

Q	Working	Answer	Mark	Notes	
	$\frac{4.5}{100} \times 25\,000\ (=1125)$ **or** $\frac{104.5}{100} \times 25000 (= 26\,125)$ **or** $1150 \times 3\ (= 3450)$ **or** $25\,000 + 1150 \times 3\ (= 28\,450)$ (allow $\frac{3 \times 4.5}{100} \times 25000 (= 3375)$ for this mark)		4	M1 finding 4.5% or 104.5% of 25 000 (allow for $3 \times 0.045 \times 25\,000$ oe) **or** the total interest for T bank **or** the total amount gained for T bank	M2 for $1.045^3 \times 25000$ (=28 529.(15313))
	$\frac{4.5}{100} \times (25\,000 + \text{'1125'})$ (= 1175.625 or 1175 or 1176) **and** $\frac{4.5}{100} \times (25\,000 + \text{'1125'} + \text{'1175.625'})$ (= 1228.529) **or** $\frac{104.5}{100} \times 26125 (= 27300.625)$ **and** $\frac{104.5}{100} \times 27300.625 (= 28529.15....)$			M1 completing the interest for C bank **or** completing the total amount for C bank	
	'1125' + '1176' + '1229' (= 3530) **or** '28 529' – 25 000 (=3529) **and** 3 × 1150 (= 3450) **or** '28 529' **and** 25 000 + '3450' (= 28 450)			M1 for total interest for C bank and total interest for T bank **or** total amount for C bank and total amount for T bank	
	Working required	79 or 80		A1 dep on M2 Allow 79 - 80	
					Total 4 marks

(**Q07 4MA1/2H, Nov 2021**)

Q13.

Q	Answer		Mark	Notes
	3×2.5 (= 7.5) oe or $2 \times 3 \times 2.5$ (= 15) oe or 12×3 (= 36) oe or $2 \times 12 \times 3$ (= 72) oe or 12×2.5 (= 30)		6	M1 for area of rectangle
	$(2 \times 3 \times 2.5) + (2 \times 12 \times 3) + (12 \times 2.5)$ (= 117) or $(2 \times 7.5) + (2 \times 36) + (12 \times 2.5)$ (= 117) or 15 + 72 + 30 (= 117)			M1 for a complete method to find the surface area
	1 + 0.1 (= 1.1) **or** 100(%) + 10(%) (= 110(%)) **or** $\frac{26.95}{110}$ (= 0.245) oe			M1
	26.95 ÷ "1.1" (= 24.5(0)) **or** 26.95 ÷ "110" × 100 (= 24.5(0)) **or** 26.95 × 100 ÷ "110" (= 24.5(0)) oe **or** "0.245" × 100 (= 24.5(0)) oe			M1 dep on previous M1
	"117" ÷ 15 (= 7.8 or 8) **and** "8" × "24.50" (= 196) **or** "117" ÷ 15 (= 7.8 or 8) **and** 200 ÷ "24.5" (= 8.1...) **or** "117" ÷ 15 (= 7.8 or 8) **and** 200 ÷ "8" (= 25)			M1for working with a whole number of tins (rounded up) to reach figures where a decision can be made
		Correct figures to show that Jonty is correct		A1 e.g. 196 7.8 or 8 **and** 8.1... 24.5 **and** 25
				Total 6 marks

(**Q10 4MA1/1HR, Jan 2022**)

Q14.

Question		Working	Answer	Mark	Notes
		$12 \times 8 \times 5$ (= 480)		3	M1
		"480" × 0.7			M1 Dep on M1
			336		A1
					Total 3 marks

(**Q06 4MA1/1H, June 2019**)

Q15.

Question	Working	Answer	Mark	Notes	
	0.08 × 170 000 (=13600) **or** 0.92 × 170 000 (=156400)		3	M1 oe eg 170 000 ÷ 12.5	M2 for 170 000 × 0.92^3
	e.g. 0.92 × (0.92 × "156400")			M1 (dep)for a complete method	
		132377		A1 or 132376.96	
				(SCB2 for 170 000 × 0.92^4)(=121786.(810)) (SCB1 for 170 000 × 0.24 (=40 800) **or** 170 000 ×0.76 (=129 200) **or** 170 000 × 1.08 (= 183 600) **or** 170 000 × 1.08^3 (= 214151) **or** an answer of 129 200 **or** an answer of 214 151 – 214151.1(0))	
					Total 3 marks

(**Q08 4MA1/1H, June 2019**)

Q16.

Q	Working	Answer	Mark	Notes	
	18000×0.15 (= 2700) oe **or** 18000×0.85 (= 15 300) oe		3	M1 for finding 15% or 85% of 18 000	M2 for 18000×0.85^4 oe **or** 18000×0.85^5 (= 7986.(69…)) oe
	eg 18000×0.85^4 oe **or** "15300"×0.85×0.85×0.85 oe **or** "15300"×0.85(=13005) oe **and** "13005"×0.85(=11054.25) oe **and** "11054.25"×0.85 oe			M1 (dep) for a complete method	
		9396		A1 awrt 9396	
				If no marks awarded, award SCB1 for **or** 18000 × 0.85^2 (= 13 005) oe **or** 18000×0.85^3 (= 11 054.(25)) oe **or** 18 000 × 0.4 (= 7200) oe **or** 18 000 × 1.15 (= 20700) oe **or** 18 000 × 1.15^4 (= 31482.(1125)) oe	
					Total 3 marks

(**QU08 4MA1/1HR, June 2022**)

Q17.

Q	Working	Answer	Mark	Notes
(a)		$5a^4c^3(5c^4d + 9a^5h)$	2	B2 If not B2 then award B1 for any **correct** factorisation with at least 2 of: the 5, a term in a, a term in c, outside the bracket eg $5ac(5a^3c^6d + 9a^8c^2h)$ **or** $a^2c(25a^2c^6d + 45a^7c^2h)$ (NB: not just a^4 etc as we want to know students have considered more than just one letter or the number) **or** the correct common factor **and** a 2 term expression inside the bracket eg $5a^4c^3(5c^4 + 9a^5)$ (this is missing d in first term and h in the second but the common factor is correct)
(b)	$4x^2 + 10x + 10x + 25 = 4x^2 - 2x + 6x - 3$ $4x^2 + 20x + 25 = 4x^2 + 4x - 3$		3	M1 Correct expansion of $(2x + 5)^2$ **or** $(2x + 3)(2x - 1)$ **or** expansion of **both** sets of brackets with at least 3 of 4 terms correct in both (NB: if written as a 3 term quadratic (and not seen as 4 terms) then the middle term must be correct as it is equivalent to 2 correct terms) (eg (RHS) $4x^2 + 4x + 3$ has 1 error, $2x^2 + 4x - 3$ has 1 error, $4x^2 + 10x - 3$ has 2 errors)
	$10x + 10x - 6x + 2x = -3 - 25$ **or** $3 + 25 = -16x$ **or** $16x = -28$ oe			M1 ft if previous mark awarded. For terms in x on one side and number terms on the other side in a correct ft equation dependent on a linear equation
	Working not required, so correct answer scores full marks (unless from obvious incorrect working eg -1.75 oe from $2x^2 + 20x + 25 = 2x^2 + 4x - 3$ scores M2A0)	-1.75		A1 **or** $-1\frac{3}{4}$ **or** $-\frac{7}{4}$ **or** $-\frac{28}{16}$ **or** $-1\frac{12}{16}$ oe
				Total 5 marks

(**Q09 4MA1/1H, June 2021**)

Q18.

Q	Working		Answer	Mark	Notes
(a)		$3c^2(6cd^2-7)$	2	B2	fully correct **or** B1 for a correct partial factorisation with at least two terms outside the bracket ie $3c(6c^2d^2-7c)$ or $c^2(18cd^2-21)$ **or** the fully correct factor outside the bracket with two terms inside the bracket and at most one mistake $3c^2(.....)$
(b) (i)	eg $(y\pm6)(y\pm3)$ or $y(y+3)-6(y+3)$ or $y(y-6)+3(y-6)$		2	M1	or $(y+a)(y+b)$ where $ab=-18$ **or** $a+b=-3$ or factorisation which expands to give 2 out of 3 correct terms
	[allow use of x rather than y]	$(y-6)(y+3)$		A1	
(ii)		6, −3	1	B1	ft must come from their factors in (b)(i)
					Total 5 marks

(**Q08 4MA1/1HR, Jan 2023**)

Q19.

Q	Working	Answer	Mark	Notes
	eg $\frac{2}{5}\times150(=60)$ **or** eg $0.32\times150\ (=48)$		5	M1 for finding the number of small mugs **or** number of medium mugs
	eg $150-$"60"$-$"48" $(=42)$			M1 for finding the number of large mugs
	eg "60" $\times$ 8.50 + "48" $\times$ 11.20 + "42" $\times$ 14.20 $(=1644)$ **or** $510+537.6+596.4$ $(=1644)$			M1 for working out the income, Profit = 504 implies M3
	eg $\frac{"1644"-1140}{1140}\times100$ **or** $\frac{"1644"}{1140}\times100-100$			M1 (indep) for a complete method to find the percentage profit for **their total income** (must be greater than 1140) An answer of 144 implies M4
		44		A1 44 or better (44.2105…)
				Total 5 marks

(**Q04 4MA1/1H, Jan 2022**)

Q20.

Q	Working	Answer	Mark	Notes
(a)	720 ÷ 12 (= 60) or 78 × 12 (= 936)		4	M1
	78 – '60' (= 18) or '936' – 720 (=216)	$'x' \times 720 = 936$ or $720(1+\frac{P}{100}) = '936'$ or $('x' =) \frac{'936'}{720} (=1.3)$ oe		M1
	$\frac{'18'}{60} \times 100$ or $\frac{'216'}{720} \times 100$	'1.3'×100 – 100 oe or (1.3 – 1)×100		M1 complete method to find *P*
		30		A1 ignore extra % sign if given bycandidate.
(b)	0.18 × 1600 (= 288) oe or 0.82 × 1600 + 800 (= 2112)		3	M1 if 1600 × 18% seen, must have further processing of the 18% or the value (288) given. M2 for 1.5 × 12.5 (= 18.75) or 18 ÷ 1.5 (= 12)
	0.125 × (1600 + 800) (= 300) oe or (1600 + 800) × 0.875 (= 2100)			M1
		Coupon B and correct figures seen		A1 for Coupon B **and** 288 and 300 or 18.75(%) and 18(%) or 12(%) and 12.5(%) or 2112 and 2100
				Total 7 marks

(**Q02 4MA1/2HR, Jan 2022**)

Q21.

Q	Working		Answer	Mark	Notes
	$\frac{2.9}{100} \times 5000 (=145)$ oe **or** 1.029×5000 (=5145) oe **or** $1.029^2 \times 5000$ (= 5294….) oe **or** 0.058×5000 (= 290) oe **or** 1.058×5000 (= 5290)			4	M1 **Bank H**
	5000×0.016 oe (= 80) oe **or** 5000×1.016 oe (= 5080) oe **or** 5000×0.032 (= 160) oe **or** 5000×1.032 (= 5160) oe	M2 for 5000×1.016^2 (= 5161.28)			M1 **Bank G**
	$(80 + 5000) \times 0.016$ (= 81.28) oe **or** 5080×1.016 (= 5161.28) oe				M1 **Bank G**
	Correct answer scores full marks (unless from obvious incorrect working)		16.28		A1
					Total 4 marks

(**Q08 4MA1/2H, Jan 2023**)

Q22.

Question	Working	Answer	Mark	Notes
	$4 \times 5 + 13 \times 6 + 16 \times 7 + 8x + 6 \times 9$ $(20 + 78 + 112 + 8x + 54)$ **or** $264 + 8x$			M1 at least 3 products correct with intention to add
	$(4 + 13 + 16 + 6 + x) \times 7$ (=7(39 + x) = 273+ 7x) **or** $(4 + 13 + 16 + 6) \times 7$(=273) oe **or** $\frac{"264+8x"}{"39+x"}$ $\frac{"264+8x"}{"39+x"} = 7$ oe eg"$264 + 8x$" = "$(39 + x)$" $\times 7$ **or** "273" – "264"			M1 M1
		9	4	A1

(**Q13 4MA1/2H, Jan 2019**)

Q23.

	9, 18, 27, 36 **and** 12, 24, 36 **or** 36 **or** a multiple of 36 **or** (9 × 12 =) 108 **or** $3^2 \times 4$ (= 36) (from Venn diagram or table)		4	M1 for at least two multiples of 9 and 12 **or** 36 **or** a multiple of 36
	"4" × 7.6(0) or "3" × 4.8(0) **or** "30.4" or "14.4" **or** "4*n*" × 7.6(0) or "3*n*" × 4.8(0)			M1 for a correct method to find the cost of 4 or 8 or 12 etc of packets of pens **or** 3 or 6 or 9 etc packets of pencils
	"4" × 7.6(0) + "3" × 4.8(0) **or** "30.4" + "14.4" **or** "4*n*" × 7.6(0) + "3*n*" × 4.8(0)			M1 for a correct combination of number of packets of pens × 7.6(0) + number of packets of pencils × 4.8(0) with an intention to add eg

pens pencil	
4 × 7.60 + 3 × 4.8 =	44.8(0)
8 × 7.60 + 6 × 4.8 =	89.6(0)
12 × 7.60 + 9 × 4.8 =	134.4(0)
16 × 7.60 + 12 × 4.8 =	179.2(0)
36 × 7.60 + 27 × 4.8 =	403.2(0)
48 × 7.60 + 36 × 4.8 =	537.6(0)

	Correct answer scores full marks (unless from obvious incorrect working)	44.8(0)		A1 allow 45 if 44.8(0) seen allow 4480 p or pence if £ sign crossed out M3A0 for 44.8*n* where *n* is an integer (eg 134.4(0))
				Total 4 marks

(**QU02 4MA1/2HR, June 2023**)

Q24.

Q	Working	Answer	Mark	Notes
	$\frac{3}{8}+45\%\left(=\frac{33}{40}\text{ or }82.5(\%)\text{or }0.825\right)$		5	M1 Do **NOT** award M1 for e.g. $\frac{3}{8}+45(\%)+406(=....)$ oe
	$1-\frac{"33"}{40}\left(=\frac{7}{40}\right)$ **or** $100-"82.5"(\%)(=17.5(\%))$ **or** $1-"0.825"(=0.175)$			M1
	$406\div\frac{"7"}{40}(=2320)$ **or** $406\div\frac{"17.5"}{100}$ oe $(=2320)$ **or** $1\%=406\div$ "17.5" $(=23.2)$ oe			M1
	$0.45\times$ "2320" oe **or** $45\times$ "23.2" oe			M1
		1044		A1
				Total 5 marks

ALT	$\frac{3}{8}x+0.45x+406$ oe		5	M1 Do **NOT** award M1 for e.g. $\frac{3}{8}+45(\%)+406(=....)$ oe
	$\frac{3}{8}x+0.45x+406=x$ oe			M1 for a correct equation
	$(x=)\frac{406}{1-\frac{3}{8}-0.45}\left(=\frac{406}{7/40}=2320\right)$			M1
	$0.45\times$ "2320"			M1
		1044		A1
				Total 5 marks

(**QU13 4MA1/1H, June 2022**)

Q25.

Q	Working	Answer	Mark	Notes		
	50 000 × 1.013 (=50 650) oe Or 50 000 × 0.013 (= 650) oe (NB: accept $\left(1+\frac{1.3}{100}\right)$ for 1.013 but not (1 + 1.3%))		3	M1	For finding 101.3% or 1.3% of 50 000	M2 for 50000×1.013^4 or 50000×1.013^5
	"50 650" × 1.013 (=51 308.45) "51 308.45"× 1.013 (=51 975.45...) "51 975.45..."× 1.013			M1	dep for a complete method	
		52 651		A1	awrt 52 651 if no marks awarded then SCB1 for $50\,000\times0.013^n$ $50\,000\times0.987^4$ (= 47450…..) 50 000 × 0.052 (= 2600) 50 000 × 1.052 ((= 52600) 50000×1.013^2 (= 51308.45) 50000×1.013^3 (= 51975.45…)	
						Total 3 marks

(**QU09 4MA1/2H, June 2022**)

Q26.

Question	Working	Answer	Mark	Notes
(a)	$545 - 500\ (=45)$ **or** $592 - 545\ (=47)$		4	M1 may be seen as part of a calculation
	$\frac{45}{500}\times 100 (=9)$ **or** $\frac{47}{545}\times 100 (=8.6)$			M1 for one correct expression (allow 8 or 8.7 from a correct expression for 8.6 throughout)
	$\frac{45}{500}\times 100 (=9)$ **and** $\frac{47}{545}\times 100 (=8.6)$			M1 for both correct expressions **or** having found "9%" finds 109% of 545: 1.09 × 545(=594.05) or 9% of 545 (49.05) or having found "8.6%" finds 108.6% of 500: 1.086 × 500(=543) or 8.6% of 500 (43)
		No, 9(%) and 8.6(%)		A1 for no oe, 9% and 8.6% seen or no oe and 9% and 594.05 or 8.6% and 543 or No, 49.05 > 45 or No 594.05 > 592 oe

Question	Working	Answer	Mark	Notes	
Alternative mark scheme for (a)					
	$\frac{545}{500}\times 100 (=109)$ or $\frac{545}{500} (=1.09)$ **or** $\frac{592}{545}\times 100 (=108.6)$ or $\frac{592}{545} (=1.086)$		4	M3 for both correct expressions which should lead to 109 **or** 1.09 **and** 108.6 **or** 1.086 (allow 108 or 108.7 from correct working for 108.6 or 1.08 or 1.087 from correct working for 1.086 throughout) (if not M3 then award M2 for one of these expressions)	
	$\frac{545}{500}\times 100 (=109)$ or $\frac{545}{500} (=1.09)$ **and** $\frac{592}{545}\times 100 (=108.6)$ or $\frac{592}{545} (=1.086)$				
		No, 109(%) and 108.6(%)		A1 oe eg no and 1.09 and 1.086	
(b)	$952 \div 85 \times 100$ oe (=1120)		3	M1 for a method to find price before discount	M2 for $\frac{952}{85}\times 15$
	$0.15 \times$ "1120" or "1120" − 952 oe			M1 for a correct method to find discount	
		168		A1	
					Total 7 marks

(**Q08 4MA1/2H, Jan 2020**)

Q27.

Q	Working	Answer	Mark	Notes
	1600×0.16 (= 256) oe or $1 - 0.16$ (= 0.84) oe		4	M1
	1600 – "256" or 1600 × "0.84" (= 1344)			M1
	$\frac{"1344"}{1400}(=0.96)$ **or** $\frac{1400-"1344"}{1400}(=0.04)$ **or** $\frac{"1344"}{1400}\times 100(=96)$ **or** $\frac{1400-"1344"}{1400}\times 100$			M1
	Correct answer scores full marks (unless from obvious incorrect working)	4		A1 SCB1 for 1856 seen if no other marks awarded
				Total 4 marks

(**Q04 4MA1/1HR, Jan 2023**)

Q28.

Question	Working	Answer	Mark	Notes
(a)	1236.5 – 1126.5 **or** 110 **or** $\frac{1236.5}{1126.5}$ **or** 1.09(7647...) **or** $\frac{1236.5}{1126.5}\times 100$ **or** 109(.7647...)			M1
	$\frac{1236.5-1126.5}{1126.5}$ **or** $\frac{"110"}{1126.5}$ **or** $\left(\frac{1236.5}{1126.5}-1\right)$ **or** $(1.09(764...)-1)$ **or** $\frac{1236.5}{1126.5}\times 100-100$ **or** 0.0976(475...)			M1 for method that would result in 9.76… or 0.0976…
		9.76	3	A1 for 9.76 - 9.765
(b)	1126.5×1.19 oe			M2 if not M2 then award M1 for $\frac{19}{100}\times 1126.5$ oe **or** 214(.035)
		1341	3	A1 for 1340 – 1342

(**Q04 4MA1/1H, Jan 2019**)

Q29.

Question		Working	Answer	Mark	Notes
	(a)	4 × 120 (= 480)			M1
		e.g. 120 ÷ 2 × 5 (= 300) **or** 120 × 0.4 × 7 (= 336) **or** (120 – '60' – '48') × 8 (= 96) **or** 120 × 0.1 × 8 (= 96)			M1 for a method to find the income for one of the selling prices
		e.g. (120 ÷ 2 × 5) + (120 × 0.4 × 7) + ((120 – '60' – '48') × 8) (= 732) **or** (120 ÷ 2 × 5) + (120 × 0.4 × 7) + (120 × 0.1 × 8) (= 732) **or** '300' + '336' + '96' (= 732)			M1 for a complete method to find the total income
		e.g. $\frac{'732'-'480'}{'480'}\times 100$ **or** '252' ÷ '480' × 100 **or** $\left(\frac{'732'}{'480'}\times 100\right)-100$ or 152.5 – 100 **or** $\left(\frac{'732'}{'480'}-1\right)\times 100$ or 0.525 × 100			M1 for a complete method to find the percentage profit
			52.5	5	A1 accept 53
	(b)	e.g. 1 + 0.2 (= 1.2) **or** 100(%) + 20(%) (= 120(%)) **or** $\frac{15}{120}$ (= 0.125) oe			M1
		e.g. 15 ÷ 1.2 **or** 15 ÷ 120 × 100 **or** 15 × 100 ÷ 120			M1 dep
			12.5(0)	3	A1 accept (£)12.5, (£)12.50p, 1250p if the £ sign is crossed out
					Total 8 marks

ALT	(a)	4 × 120 (= 480)			M1
		e.g. 120 ÷ 2 × 1 (= 60) **or** 120 × 0.4 × 3 (= 144) **or** (120 – '60' – '48') × 4 (= 48) **or** 120 × 0.1 × 4 (= 48)			M1 for a method to find the profit of one of the books
		e.g. (120 ÷ 2 × 1) + (120 × 0.4 × 3) + ((120 – '60' – '48') × 4) (= 252) **or** (120 ÷ 2 × 1) + (120 × 0.4 × 3) + (120 × 0.1 × 4) (= 252) **or** '60' + '144' + '48' (= 252)			M1 for a complete method to find the total profit
		'252' ÷ '480' × 100 oe			M1 for a complete method to find the percentage profit
			52.5	5	A1 accept 53
	(b)	e.g. 1 + 0.2 (= 1.2) **or** 100(%) + 20(%) (= 120(%)) **or** $\frac{15}{120}$ (= 0.125) oe			M1
		e.g. 15 ÷ 1.2 **or** 15 ÷ 120 × 100 **or** 15 × 100 ÷ 120			M1 dep
			12.5(0)	3	A1 accept (£)12.5, (£)12.50p, 1250p if the £ sign is crossed out
					Total 8 marks

(**Q05 4MA1/2H, June 2019**)

Q30.

Q	Working	Answer	Mark	Notes
a	1.04 × 3 130 000 oe		3	M2 complete method to increase salary by 4% M1 for 0.04 × 3 130 000 oe (= 125 200)
		3 255 200		A1
b	for 0.15 × 750 000 oe (=112 500) **or** 0.85 × 750 000 oe (637 500)		3	M1 For method to find depreciation for 1 year or value after 1 year **OR** M2 for 750 000 × 0.85^3 (= 460 593.75) **or** $750\,000 \times 0.85^4$ (= 391 504.69) (M1 for 750 000 × 0.85^2 (= 541 875)
	0.85 × "637 500" (= 541 875) oe 0.85 × "541 875" (= 460 593.75) oe **OR** $750\,000 \times 0.85^3$			M1 for completing method
		460 594		A1 accept 460 593 – 460 594
				SC: if no other marks gained award M1 for 0.55 × 750 000 oe (= 412 500) **or** 0.45 × 750 000 oe (= 337 500) accept (1 – 0.15) as equivalent to 0.85 throughout
				Total 6 marks

(**Q05 4MA1/2H, Nov 2020**)

Q31.

Q	Working	Answer	Mark	Notes
(a)	520 – 465 (= 55) **or** $\frac{520}{465}$ (=1.118…)	11.8	3	M1
	$\frac{"55"}{465} \times 100$ **or** 100 × ("1.118" – 1) oe			M1
				A1 11.8 or better (11.827956...)
(b)	0.12 × 550 (= 66)	484	3	M1 oe M2 for 0.88 × 550
	550 – "66"			M1
				A1
				Total 6 marks

(**Q03 4MA1/2H, Jan 2021**)

Q32.

Q	Working	Answer	Mark	Notes	
(a)	eg 100 + 24 (=124 [%]) **or** 1 + 0.24 (= 1.24) **or** $\frac{180000}{124}$ (=1451.6...)		3	M1	
	eg 180 000 ÷ 1.24 180 000 ÷ 124 × 100 or 180 000 × 100 ÷ 124 oe			M1 for a complete method	
	Working not required, so correct answer scores full marks (unless from obvious incorrect working) *NB: this question is one where students could misread the number of zeros (eg one too many or one too few) in the question, up to M2 could be awarded if a correct method is seen with this misread*	145 000		A1 accept 145 000 – 145 200 (if a correct answer is seen in working and then rounded incorrectly, award full marks) (if no marks awarded, SCB1 for 223 200 or 223 000)	
(b)	for 0.018 × 120 000 oe **or** 2160 **or** 1.018 × 120 000 oe **or** 122 160		3	M1 For finding 1.8% or 101.8% of the value	**OR** M2 for 120 000 × 1.018^3 **or** 120 000 × 1.018^4 **or** 128 876.09 (M1 for 120 000 × 1.018^2 **or** 124 358.88)
	1.018 × "122 160" (= 124 358.88) oe **and** 1.018 × "124 358.88" (= 126 597.34) oe			M1 for completing the method	
	Working not required, so correct answer scores full marks (unless from obvious incorrect working) *NB: this question is one where students could misread the number of zeros in 120 000 (eg one too many or one too few) in the question, up to M2 could be awarded if a correct method is seen with this misread*	127 000		A1 or 126 597 – 126 600 (if a correct answer is seen in working and then rounded incorrectly, award full marks) **SC**: if no other marks gained award M1 for 1.054 × 120 000 oe **or** 126 480 **or** 6 480 accept (1 + 0.018) as equivalent to 1.018 throughout	
					Total 6 marks

(**Q11 4MA1/2H, June 2021**)

Q33.

Q	Working	Answer	Mark	Notes
(a)	18 000 + 14 × 1160 (= 34 240) oe or 18 000 + 16 240 (= 34 240)		4	M1
	"34 240" – 32 000 (= 2240) or $\frac{"34\ 240"}{32\ 000}$ (= 1.07)			M1
	$\frac{"2240"}{32\ 000}(\times 100)$ or $\frac{"34\ 240"}{32\ 000}\times 100$ (= 107) or "1.07" – 1 (= 0.07)			M1
	Correct answer scores full marks (unless from obvious incorrect working)	7		A1
(b)	e.g. 1 – 0.15 (= 0.85) or 100(%) – 15(%) (= 85(%))		3	M1
	e.g. 39 865 ÷ 0.85 or 39 865 ÷ 85 × 100 oe			M1
	Correct answer scores full marks (unless from obvious incorrect working)	46 900		A1
				Total 7 marks

(**Q06 4MA1/1H, Jan 2023**)

Q34.

(a)	$7 \times 5 \times 14$ (= 490) oe **or** 7×14 (= 98) **and** 400 ÷ 5 (= 80)		4	M1 for working out the pay per week or pay per day
	"490" – 400 (= 90) **or** "98" – "80" (= 18) **or** "98" ÷ "80" oe **or** "490" ÷ 400 oe **or** 1.225 oe			M1
	$\frac{"90"}{400}(\times 100)(= 0.225)$ oe **or** $\frac{"18"}{"80"}(\times 100)(= 0.225)$ oe **or** $\frac{"98"}{"80"} \times 100 (= 122.5)$ oe **or** $\frac{"490"}{400} \times 100 (= 122.5)$ oe **or** "1.225" – 1 (= 0.225)			M1 dep on M2
	Correct answer scores full marks (unless from obvious incorrect working)	22.5		A1 oe allow 23% with M3 awarded
(b)	E.g. $1 - 0.06$ (= 0.94) or 100(%) − 6(%) (= 94(%)) or $\frac{23\,030}{94}$ (= 245) oe		3	M1
	E.g. 23 030 ÷ "0.94" or 23 030 ÷ "94" × 100 or 23 030 × 100 ÷ "94" or "245" × 100			M1
	Correct answer scores full marks (unless from obvious incorrect working)	$\frac{24}{500}$		A1
				Total 7 marks

(**QU06 4MA1/2HR, June 2023**)

Q35.

	$\frac{1}{2}(330+170)\times 240$ (= 60 000) oe or $\left(\frac{80\times 240}{2}\right)+(170\times 240)+\left(\frac{80\times 240}{2}\right)$ (= 60 000) oe or (2 × 9600) + 40 800 (= 60 000) oe		4	M1 for working out the area of the trapezium
	[60 000] ÷ 10 000 (= 6) or 10 000 × 6 (= 60 000)			M1 ft their area (must come from a two dimensional area) Allow $\frac{\text{their area}}{10\,000}$
	49 650 ÷ [6]			M1 dep on either previous M1 f their number of hectares Allow $\frac{49\,650}{\text{their number of hectares}}$
	Correct answer scores full marks (unless from obvious incorrect working)	8275		A1
				Total 4 marks

(**QU05 4MA1/2HR, June 2023**)

Q36.

Q	Working	Answer	Mark	Notes
	1 + 0.12 (= 1.12) or 100(%) + 12(%) (=112(%)) or $\frac{18.20}{112}(=\frac{13}{80}=0.1625)$ or $x+0.12x=18.2(0)$ or $x\times 1.12=18.2(0)$			M1
	eg 18.2(0) ÷ (1 + 0.12) oe or $\frac{18.2(0)}{112}\times 100$ oe			M1 for a complete method
		16.25		A1
				Total 3 marks

(**QU08 4MA1/2HR, June 2022**)

Q37.

Question	Working	Answer	Mark	Notes
	$n = 50$		3	B1
	$33125 = \frac{50}{2}[2\times 50 + (50-1)\times k]$ oe $33125 = 25[100 + 49k]$ oe $1325 = 100 + 49k$ oe $1225 = 49k$ oe			M1 For correct equation, using formula with a = 50 and n = 50 substituted (for this mark, allow n = 49) (k may be written as d)
		25		A1
				Total 3 marks

(**Q25 4MA1/2H, Jan 2020**)

Q38.

Q	Working	Answer	Mark	Notes
(i)		21, 27	1	B1
(ii)		21, 23, 24, 25, 27, 29	1	B1
				Total 2 marks

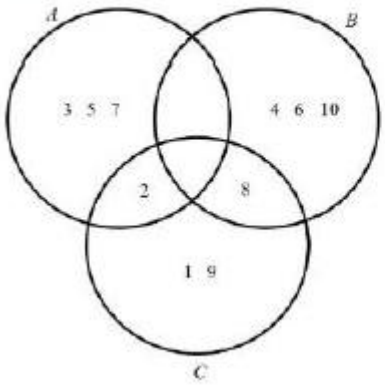
(**Q04 4MA1/1H, Jan 2021**)

Q39.

Question		Working	Answer	Mark	Notes
	(a)		7, 8, 9, 10, 11	2	B2 completely correct. (B1 for 4 or 5 correct and no more than 1 incorrect **or** for all terms seen correctly placed in a Venn diagram or for a correct description of the numbers in the set but not listed, eg $7 \le x < 12$)
	(b)		eg 2, 4, 6	1	B1 for any 3 of 2, 4, 6, 8, 10
					Total 3 marks

(**Q14 4MA1/1H, June 2019**)

Q40.

Question		Working	Answer	Mark	Notes
	(a)	**Examples** There are no members that are in both *A* and *B* No members in common (in *A* and *B*) No numbers the same (in *A* and *B*) *B* has even numbers. *A* has odd numbers except 2 which is not in *B* Nothing in *A* is in *B* oe No overlap A and B don't share any numbers	Correct statement	1	B1 for a statement which indicates correct meanings for intersection and empty set
	(b)		1 and 9	1	B1
	(c)	e.g.  	1, 2, 8, 9	2	B2 for fully correct (B1 for 3 or 4 correct with no more than one addition or a fully correct Venn diagram)
					Total 4 marks

(**Q03 4MA1/2H, June 2019**)

Q41.

Q	Working	Answer	Mark	Notes
(a)(i)		9, 15	1	B1 no repeats
(a)(ii)		9, 11, 12, 13, 15, 17, 18, 19	1	B1 no repeats or omissions
(b)	**No must be ticked along with a reason for the award of this mark**	No with a correct reason	1	B1 No with eg 24/it is not in the universal set, 24/it is not between 9 and 20 (need some sort of reference that the numbers in the sets do not go beyond 20)
(c)		10, 18 and two from 9, 11, 13, 15, 17, 19	2	B2 for 10, 18 and two from 9, 11, 13, 15, 17, 19 (B1 a set of 4 numbers of which 3 are correct or a set of 5 numbers including 10, 18, and no more than one incorrect number or a set of 3 or more numbers from {10, 18, 9, 11, 13, 15, 17, 19})
				Total 5 marks

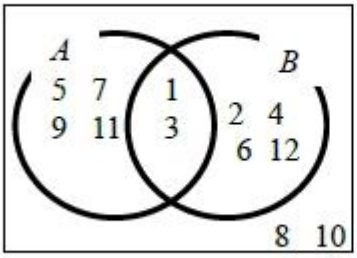
(**QU04 4MA1/2HR, June 2022**)

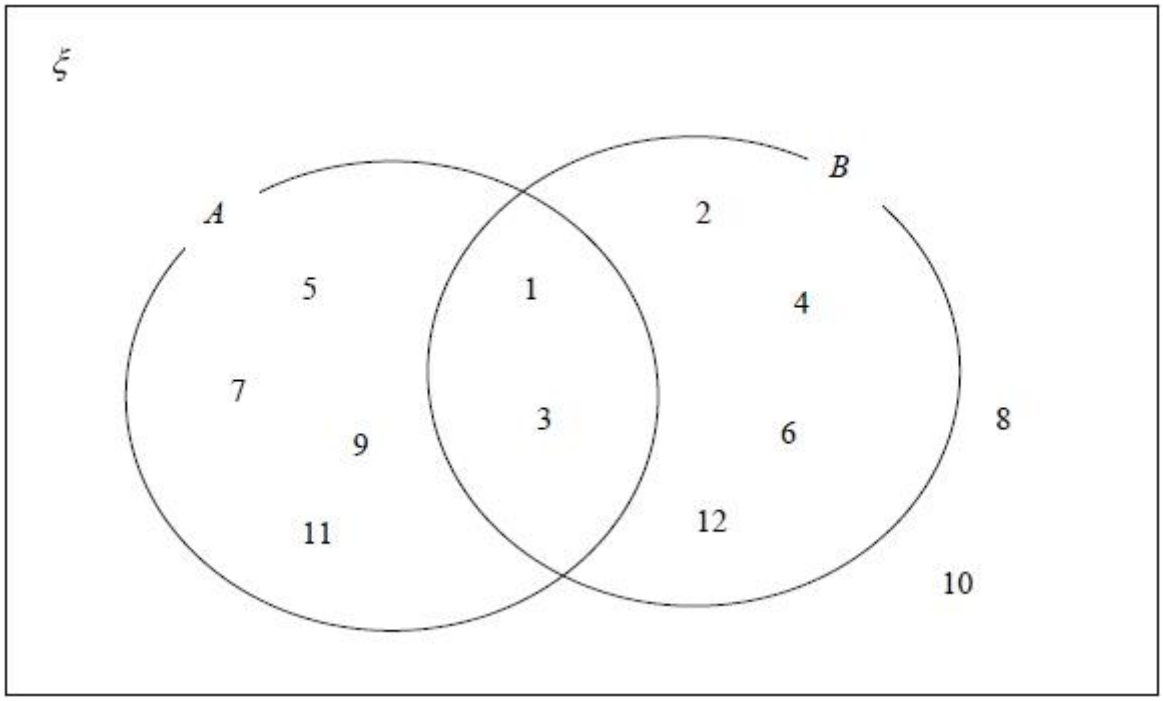
Q42.

(a)(i)		5, 7, 11, 13	1	B1
(ii)		5, 6, 8, 10, 12, 14, 15	1	B1
(b)		Correct reason	1	B1 eg 9 is not a member of C or 9 is not in C or C only contains 6, 8, 10, 12, 14 or 9 is outside of C there must be no contradictory or incorrect statements
				Total 3 marks

(**QU02 4MA1/1HR, June 2023**)

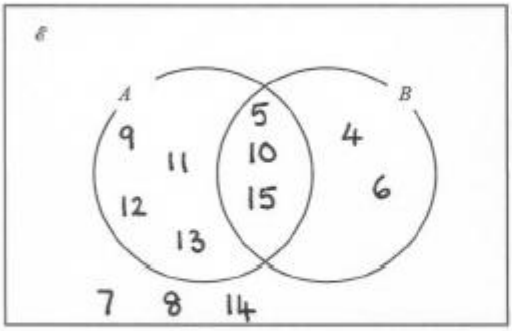
Q43.

Question	Working	Answer	Mark	Notes
		Fully correct Venn diagram	4	B4 fully correct Venn diagram with labels A and B (If not B4 then B3 for 3 correct regions, B2 for 2 correct regions B1 for 1 correct region)



(**Q04 4MA1/2H, Jan 2019**)

Q44.

Q	Working	Answer	Mark	Notes
			3	B3 all 4 parts of diagram correct (B2 for 2 or 3 parts correct) (B1 for 1 part correct) SCB1 if no marks scored, award B1 if 4,6 in the section $A \cap B'$ and 9, 11, 12, 13 in the section $A' \cap B$
				Total 3 marks

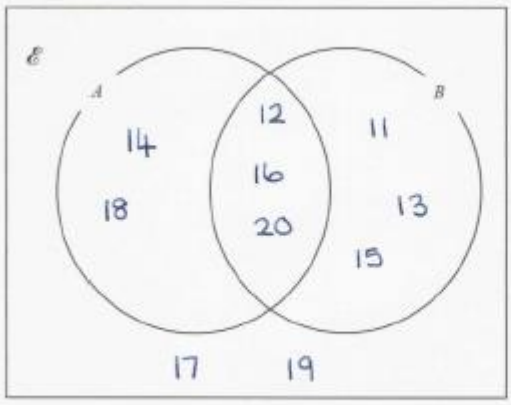
(**Q07 4MA1/1H, Jan 2022**)

Q45.

Q	Working	Answer	Mark	Notes
(i)		19	1	B1
(ii)		0	1	B1
(iii)		11	1	B1
(iv)		28	1	B1
				Total 4 marks

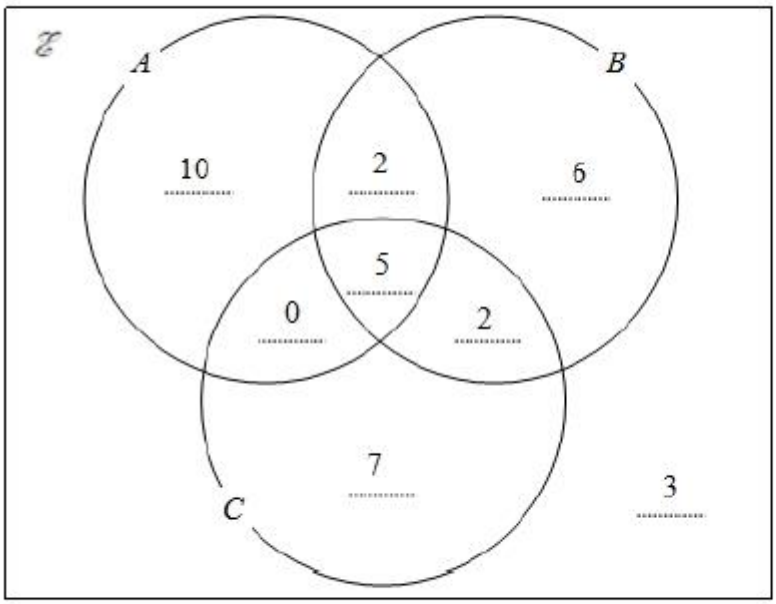
(**Q17 4MA1/1HR, Jan 2022**)

Q46.

Q	Working	Answer	Mark	Notes
			3	B3 Fully correct (B2 for 2 or 3 'regions' correct, B1 for one 'region' correct)
				Total 3 marks

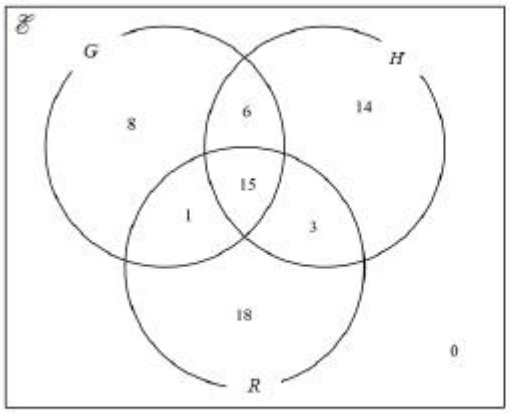
(**Q03 4MA1/2H, Jan 2023**)

Q47.

Q	Working	Answer	Mark	Notes
		Fully correct Venn diagram	4	B4 for all 8 sections correct If not B4, then award B3 for 6 or 7 sections correct B2 for 4 or 5 sections correct B1 for 2 or 3 sections correct Allow the section where 0 should be to be blank if all other sections are populated with a number.
				Total 4 marks

(**Q20 4MA1/2HR, Jan 2023**)

Q48.

Question	Working	Answer	Mark	Notes
(a)		Correct Venn diagram	3	M2 for at least 4 correct entries If not M2 then M1 for 2 or 3 correct entries NB: For the award of the method marks do **not** accept a blank outside the circles as 0 Accept omission of 0 for the award of full marks
(b)		$\frac{3}{18}$ oe	2	M1 ft from Venn diagram for $\frac{a}{"18"}$ where a is an integer and $1 \le a < "18"$ or for $\frac{"3"}{b}$ where b is an integer and $b > "3"$ A1 ft from Venn diagram

(**Q13 4MA1/1H, Jan 2019**)