

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCSE

Mathematics A

Paper 1 (Non-Calculator)

Higher Tier

Sample Assessment Material
Time: 1 hour 45 minutes

Paper Reference
1MA0/1H

You must have:

Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- **Calculators must not be used.**



Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
– *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

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Turn over

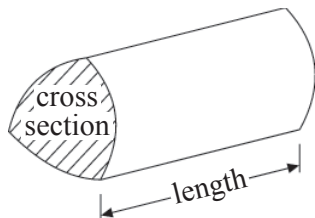
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GCSE Mathematics 1MA0

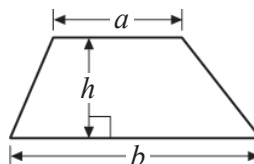
Formulae – Higher Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section \times length

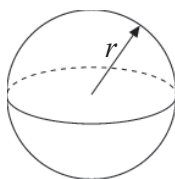


Area of trapezium = $\frac{1}{2}(a + b)h$



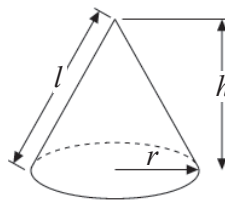
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

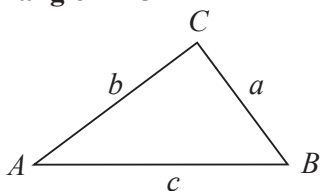


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$

where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2}ab \sin C$

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1 (i) Simplify $13x - 24y + 17x + 14y$

(ii) Solve $6(1 - 2x) - 3(x + 1) = 0$

(Total for Question 1 = 5 marks)

*2 Jennie's council has a target of $\frac{1}{5}$ for households to recycle their waste.

In January, Jennie recycled $\frac{1}{10}$ of her household waste.

In February, she recycled 15 kg of her 120 kg of household waste.

Her result for March was 13 % recycled out of 112 kg of household waste.

Has Jennie met the council's target?

Which was her best month for recycling?

Show clearly how you got your answers.



(Total for Question 2 = 4 marks)

3

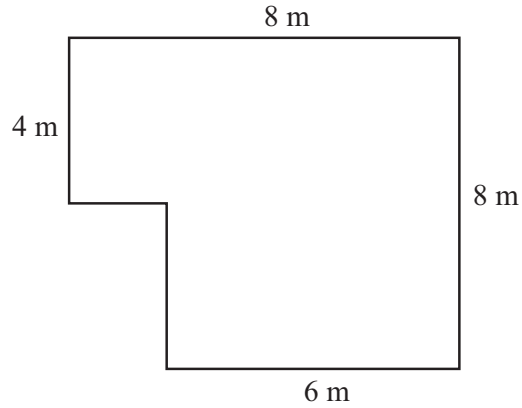


Diagram **NOT**
accurately drawn

The diagram is a plan of the floor of Nikola's room.
All the angles are right angles.
Nikola is going to lay carpet tiles to cover all the floor.
Each tile is a square 50 cm by 50 cm.
Each tile costs £4

Work out the total cost of the carpet tiles needed to cover all the floor.

£

(Total for Question 3 = 6 marks)

4 (a) Solve $5p - 16 = 4$

(2)

$p = \dots\dots\dots$

(b) Solve $2q - 4 = 5q + 5$

(2)

$q = \dots\dots\dots$

$y = 3(2x - 1) - 2(5 + 3x)$

(c) Show that y will always be the same value.

(2)

(Total for Question 4 = 6 marks)

5 The n th term of a sequence is $2n^2$

(i) Find the 4th term of the sequence.

.....

(ii) Is the number 400 a term of the sequence?

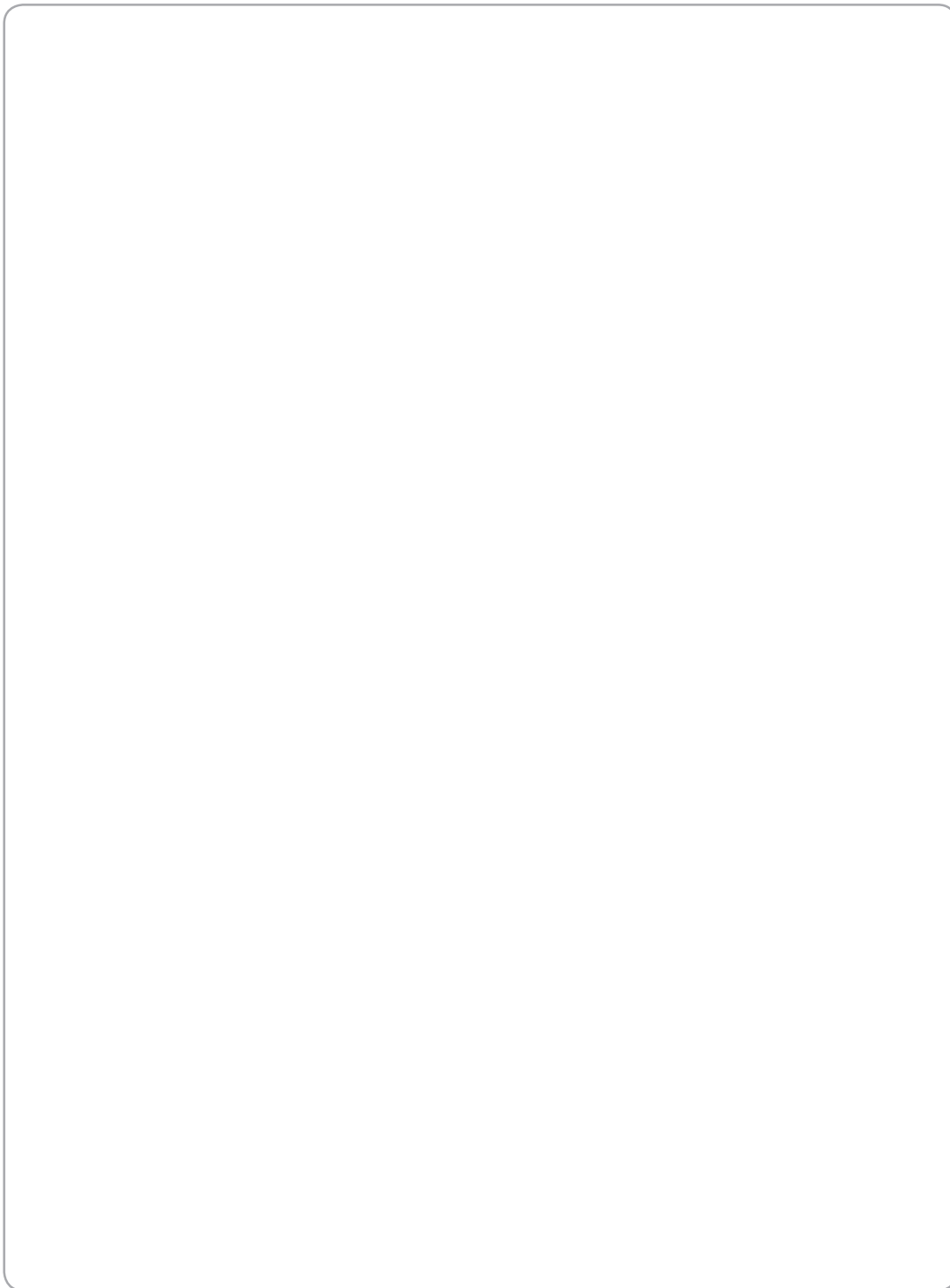
.....

Give reasons for your answer.

(Total for Question 5 = 3 marks)

- 6 Last year Sasha was paid £15400 after deductions from her gross salary.
She was paid 70% of her gross salary.
This year Sasha's gross salary increased by 2%.

Work out the increase in Sasha's gross salary. Give your answer in pounds.



£

(Total for Question 6 = 4 marks)

7 (a) Express 66 as a product of its prime factors.

(2)

(b) Express 132^2 as a product of its prime factors.

(2)

(Total for Question 7 = 4 marks)

8 A bag contains only red, yellow and blue discs.

The probability of drawing a red disc at random is $\frac{1}{2}$

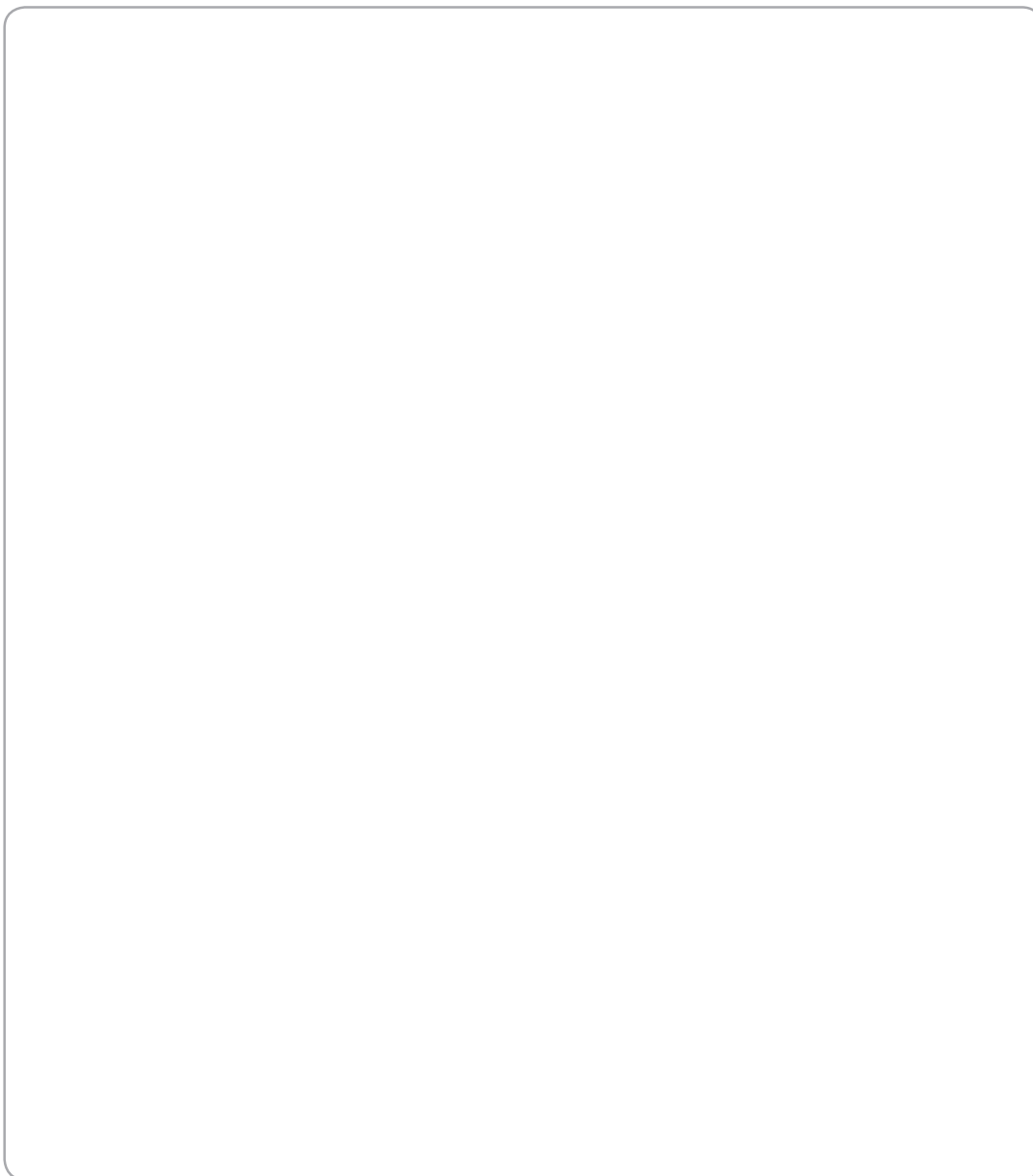
The probability of drawing a yellow disc at random is x

The probability of drawing a blue disc at random is $4x$

One disc is to be selected at random.

Work out the probability that it will be a blue disc.

Give your answer as a numerical value.



.....
(Total for Question 8 = 3 marks)

9 (a) Simplify

(i) $a^5 \div a^3$

(3)

.....

(ii) $2x^2 \times 3x^2y^2$

.....

(b) Expand and simplify $(x + 3)(x + 7)$

(2)

.....

(c) Factorise fully $3pq - 12p^2$

(2)

.....

(d) (i) Factorise $3y^2 - 10y + 3$

(4)

.....

Hence, or otherwise

(ii) Factorise $3(x + 2)^2 - 10(x + 2) + 3$

.....

(Total for Question 9 = 11 marks)

10



The diagram represents 100 cards. Each card has a whole number from 1 to 100 on it.
No cards have the same number.

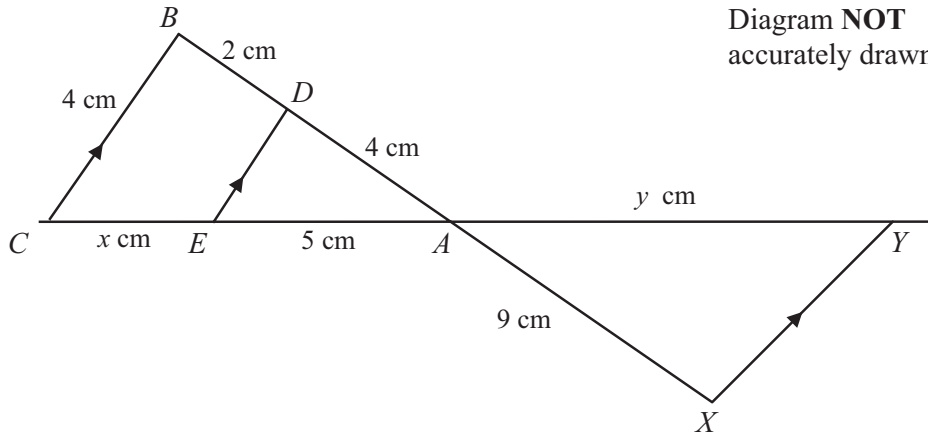
Bill puts a red dot on every card which has a multiple of 6 on it.
Parul puts a green dot on every card which has a multiple of 9 on it.

All the cards are placed in a bag.
Vicki selects a card is selected at random.

What is the probability that the card has both a red and a green dot on it?

.....
(Total for Question 10 = 3 marks)

11



$CEAY$ and $BDAX$ are straight lines.

XY , ED and CB are parallel.

$AE = 5$ cm.

$AX = 9$ cm.

$AD = 4$ cm.

$BC = 4$ cm.

$BD = 2$ cm.

$CE = x$ cm.

$XY = y$ cm.

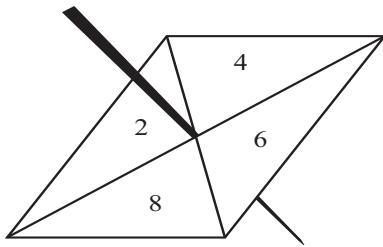
Find the value of x and the value of y .

$x = \dots\dots\dots$

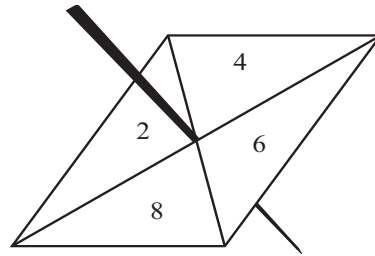
$y = \dots\dots\dots$

(Total for Question 11 = 4 marks)

12 Here are two fair 4-sided spinners.
One is a Blue spinner and one is a Red spinner.



Blue spinner



Red spinner

Each spinner has four sections numbered 2, 4, 6 and 8

Each spinner is to be spun once.

Total score = Blue spinner score + Red spinner score

(a) Find the probability that the total score will be 10

(3)

Ali and Shazia play a game.

In each round of the game, Ali spins the Blue spinner once and Shazia spins the Red spinner once.

Ali wins when the Blue spinner score is greater than the Red spinner score.

Ali and Shazia play 80 rounds.

(b) Work out an estimate of the number of rounds that Ali will win.

(3)

.....
(Total for Question 12 = 6 marks)

13 The population of Algeria is 34 million.

(a) Write 34 million in standard form.

(1)

.....

The total land area of Algeria is 2.4×10^{12} m².
5% of the total land area is used to grow crops.

(b) Work out the area of land in Algeria which is used to grow crops.
Write your answer in standard form, in km².

(2)

..... m²

(Total for Question 13 = 3 marks)

14

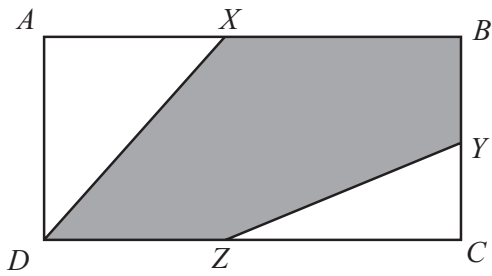


Diagram **NOT**
accurately drawn

$ABCD$ is a rectangle.

X is the midpoint of AB .

Y is the midpoint of BC .

Z is the midpoint of CD .

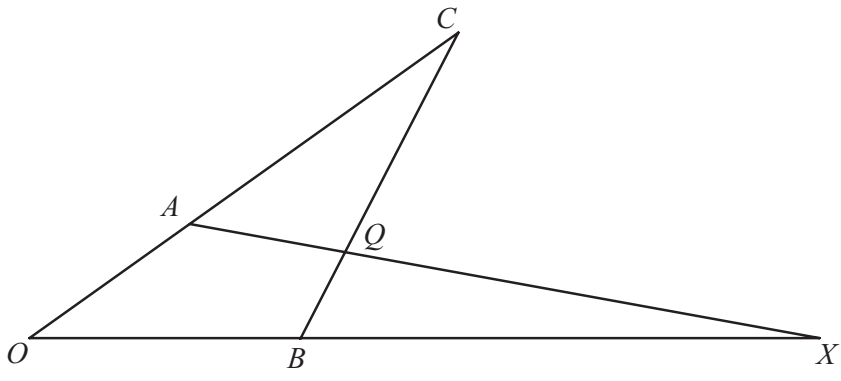
What fraction of the total area of $ABCD$ is shaded?

Show clearly how you get your answer.

.....
(Total for Question 14 = 4 marks)

15

Diagram **NOT**
accurately drawn



In the diagram,

$$\vec{OA} = 4\mathbf{a} \quad \text{and} \quad \vec{OB} = 4\mathbf{b}$$

OAC , OBX and BQC are all straight lines

$$AC = 2OA \quad \text{and} \quad BQ : QC = 1 : 3$$

(a) Find, in terms of \mathbf{a} and \mathbf{b} , the vectors which represent

(4)

(i) \vec{BC}

.....

(ii) \vec{AQ}

.....

Given that $\vec{BX} = 8\mathbf{b}$

(b) Show that AQX is a straight line.

(3)

(Total for Question 15 = 7 marks)

16 There are 10 students in a class.
6 of the students are boys and 4 of the students are girls.
Three students are picked at random from the class to form a team.
Work out the probability that the team consists of 1 girl and 2 boys.

.....
(Total for Question 16 = 4 marks)

17 Simplify $\frac{3x^2 - 16x - 35}{9x^2 - 25}$

.....
(Total for Question 17 = 3 marks)

18 $\sqrt{3} = 3^k$

(a) Write down the value of k

(1)

.....

(b) Expand and simplify $(2 + \sqrt{3})(1 + \sqrt{3})$

Give your answer in the form $a + b\sqrt{3}$

where a and b are integers

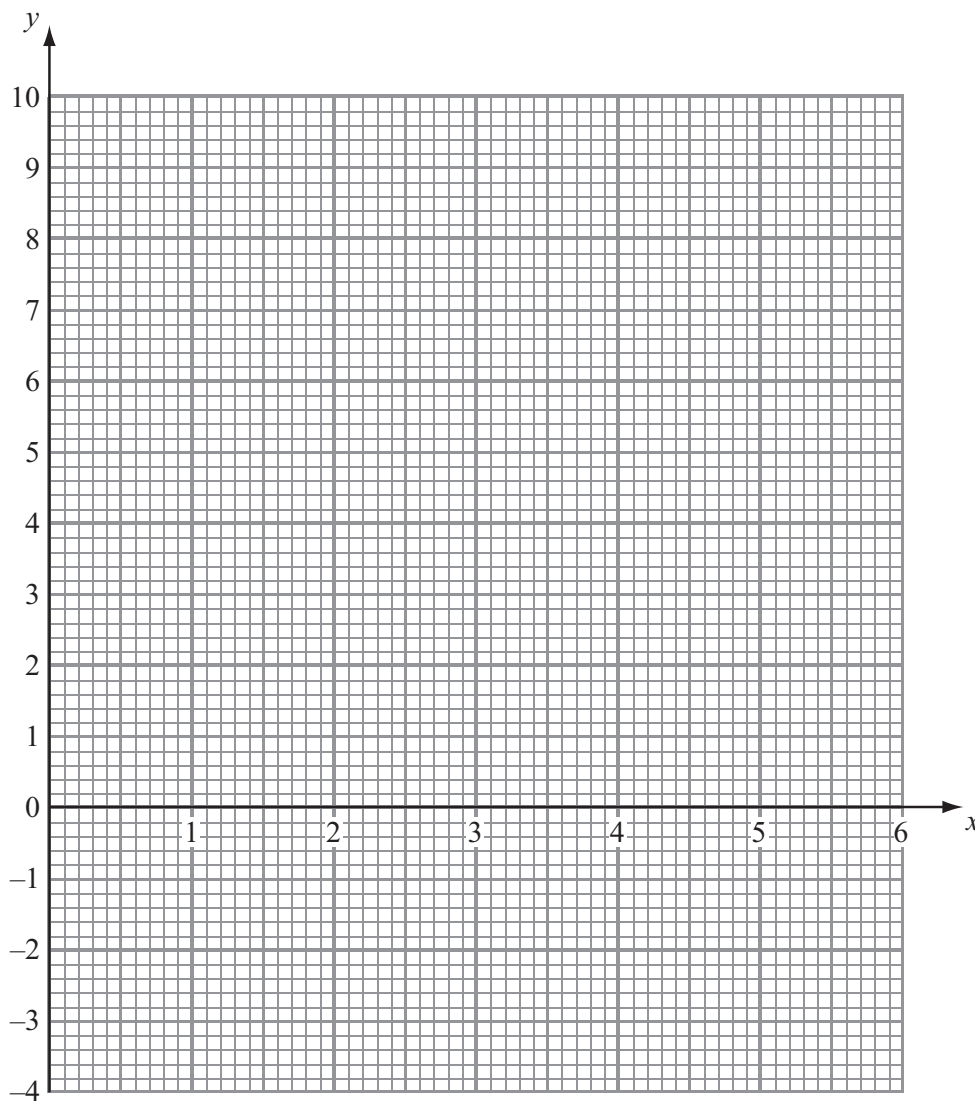
(2)

.....

(Total for Question 18 = 3 marks)

19 (a) On the grid draw the graph of $y = x(x - 3)$

(2)



(b) Using your result for (a), or otherwise,
solve the simultaneous equations

$$y = x(x - 3)$$

$$x^2 + y^2 = 9$$

(3)

(Total for Question 19 = 5 marks)

***20** Prove that the difference between the squares of consecutive odd numbers is a multiple of 8

(Total for Question 20 = 6 marks)

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21 Mr Walton is responsible for maintaining fish stocks in a river. The table gives some information about the lengths, in centimetres, of a type of fish caught from the river.

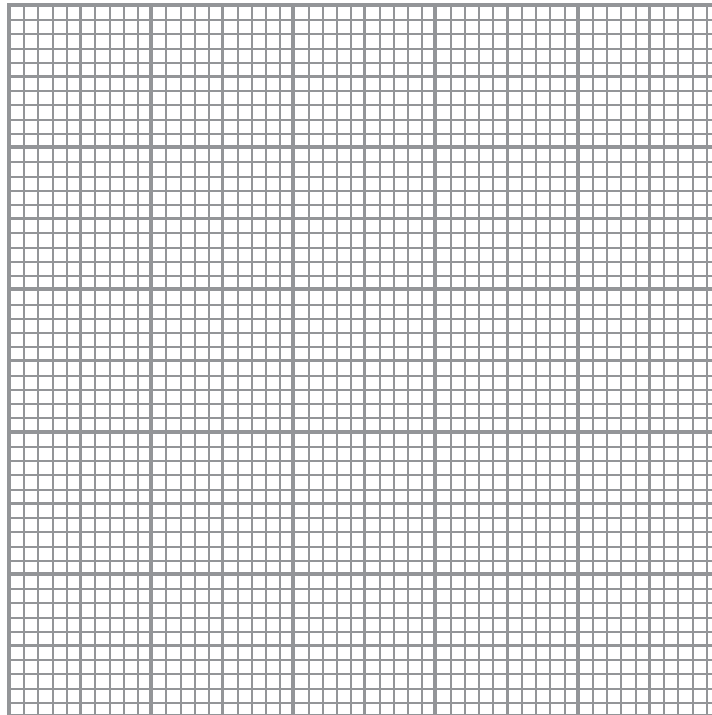
| Length (L) cm | Frequency |
|------------------|-----------|
| $0 < L \leq 10$ | 40 |
| $10 < L \leq 20$ | 60 |
| $20 < L \leq 40$ | 90 |
| $40 < L \leq 80$ | 60 |
| $L > 80$ | 0 |

He wants to study the effect of returning to the river fish less than 50 cm in length that are caught.

Mr Walton suggests that fish which are less than 50 cm in length are returned to the river.

Draw a suitable statistical diagram for the information in the table.

Use it to find an estimate of the percentage of fish returned to the river.



..... %

(Total for Question 21 = 6 marks)

TOTAL FOR PAPER = 100 MARKS

Specification A: Paper 1 Higher Tier

| 1MA0/1H | | Working | Answer | Mark | Additional Guidance |
|------------------------------------|------------------|------------------------------------------------|---------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | (i) | | $30x - 10y$ | 5 | B2 cao (If no marks then B1 30x, B1 10y) |
| | (ii) | $6 - 12x - 3x - 3 = 0$ $3 - 15x = 0$ $15x = 3$ | $1 \frac{1}{5}$ | | M1 for correct multiplication of brackets to get $6 - 12x - 3x - 3$ A1 $3 - 15x = 0$ B1 ft for " $\frac{1}{5}$ " |
| Total for Question: 5 marks | | | | | |
| 2. | QWC iii FE | See table at end | Best month and supporting explanation | 4 | M1 Converts for at least 2 months to a common format (fractions, decimals or %age) A1 all correct C1 for Council target: No (yes) dep on M1 and consistent with the candidates calculations QWC: Decisions should be stated, following through from working out C1 March with all calculations correct for the 3 months QWC: Decisions should be stated, following through from working out |
| Total for Question: 4 marks | | | | | |

| 1MA0/1H | | | | | |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Question | Working | Answer | Mark | Additional Guidance | |
| 3. FE | No of tiles around room $= 2 \times \text{lengths of room} = 8, 16, 16, 12$ Total number of tiles $= 8 \times 16 + 8 \times 12 = 224$ Cost = 4×224 OR Area of the room $= 4 \times 8 + 4 \times 6 = 56$ Area of a tile $= 0.5 \times 0.5 = 0.25$ Number of tiles = $56 \div 0.25$ $= 224$ Cost = 4×224 | £ 896 | 6 | M1 for doubling each length to show number of tiles for each side B1 for 8, 16, 16 and 12 M1 for a full method of finding the number of tiles ($12 \times 16 + 8 \times 4$) A1 for at least one 'section' correct M1 for $4 \times '224'$ A1 cao OR M1 for full method for finding the area of the room A1 at least one area correct B1 for area of tile = 0.25m^2 or 2500 cm^2 or 4 tiles = 1 m^2 M1 for area of room \div area of a tile M1 for $4 \times$ number of tiles A1 cao | |
| | | | | Total for Question: 6 marks | |
| 4. | (a) | $5p = 20$ | $p = 4$ | 2 | M1 add 16 to both sides A1 cao |
| | (b) | $-9 = 3q$ | $q = -3$ | 2 | M1 correct method to isolate $\pm 3q$ A1 cao |
| | (c) | $6x - 3 - 10 - 6x =$ | -13 | 2 | M1 at least one expansion correct A1 -13 or a statement that the answer is indep of x depending on correct working |
| | | | | Total for Question: 6 marks | |

| 1MA0/1H | | | | |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | Working | Answer | Mark | Additional Guidance |
| 5. | | | | |
| (i) | | 32 | 1 | B1 cao |
| (ii) | $2n^2 = 400, n^2 = 200, n$ not a whole number | No + explanation | 2 | M1 sets $2n^2 = 400$ C1 and concludes correctly OR M1 14th term is (392), 15th term is (450) C1 and concludes correctly |
| Total for Question: 3 marks | | | | |
| 6. | | | | |
| FE | $15400 \div 70 \times 100 = 22000$ $22000 \times 2 \div 100$ | 440 | 4 | M1 $15400 \div 70 \times 100$ oe A1 22000 M1 '22000' $\times 2 \div 100$ oe A1 cao |
| Total for Question: 4 marks | | | | |
| 7. | | | | |
| (a) | $66 = 2 \times 33 = 2 \times 3 \times 11$ | $2 \times 3 \times 11$ | 2 | M1 Successive division by 2 and 3 either by a factor tree or by repeated division A1 cao |
| (b) | $132^2 = 4 \times 66^2$ $= 2^2 \times (2 \times 3 \times 11)^2$ OR $132^2 = 17424 = 2 \times 8712$ $= 2 \times 2 \times 4356 =$ $2^3 \times 2178 = 2^4 \times 1089$ $= 2^4 \times 3 \times 363 = \dots$ | $2^4 \times 3^2 \times 11^2$ | 2 | M1 $(2 \times 3 \times 11)^2$ A1 $2^2 \times 3^2 \times 11^2$ oe OR M1 $132^2 = 17424$ and at least 3 correct steps in for example the factor tree |
| Total for Question: 4 marks | | | | |

| 1MA0/1H | | | | |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------|--------------------------------------------------------------------------------|
| Question | Working | Answer | Mark | Additional Guidance |
| 8. | $x + 4x + \frac{1}{2} = 1$ $5x = \frac{1}{2}, x = \frac{1}{10}$ OR Chooses a suitable number of balls (say 10) 5 will be red The other 5 need to be shared out in the ratio 1:4, Hence 1 yellow and 4 blue | $\frac{4}{10}$ | 3 | M1 $x + 4x + \frac{1}{2} = 1$ A1 $x = \frac{1}{10}$ A1 $\frac{4}{10}$ oe |
| | | | | Total for Question: 3 marks |

| 1MA0/1H | | | | |
|----------|---------|-----------------------------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------|
| Question | Working | Answer | Mark | Additional Guidance |
| 9. | (a) (i) | a^2 | 3 | B1 cao |
| | (ii) | $6x^4y^3$ | | B2 $6x^4y^3$ (B1 for 2 out of 3 terms correct in a product) |
| | (b) | $x^2 + 3x + 7x + 21$ | 2 | M1 3 or 4 terms out of 4 correct in a 4 term expansion A1 cao |
| | (c) | $3p(q - 4p)$ | 2 | B2 cao (B1 $p(3q - 12p)$, $12p(\frac{1}{4}q - p)$, $p(aq + bp)$ where a and b are numbers) |
| | (d)(i) | $(3(x + 2) - 1)(x + 2 - 3)$ | 4 | B2 cao (B1 $(3y - m)(y - n)$ where $mn = \pm 3$ or $m + n = \pm 10$) |
| | (ii) | OR $3x^2 + 12x + 12 - 10x - 20 + 3$ $= 3x^2 + 2x - 5$ | | M1 use of the factorised form with y replaced twice by $3x + 2$ A1 cao OR B1 $3x^2 + 2x - 5$ B1 cao |
| | | | | Total for Question: 11 marks |

| 1MA0/1H | | | | |
|------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | Working | Answer | Mark | Additional Guidance |
| 10. | Reds 6, 12, 18, 24, 30... Greens 9, 18, 27... | $\frac{1}{20}$ | 3 | B1 list of red and green multiples (both to at least 18) or explicitly states 'LCM' B1 works out highest number (90 seen) B1 $\frac{1}{20}$ (accept $\frac{5}{100}$) |
| Total for Question: 3 marks | | | | |
| 11. | $\frac{x}{5} = \frac{2}{4}$ $\frac{y}{x+5} = \frac{9}{6}$ or $\frac{y}{9} = \frac{x+5}{6}$ | $x = 2.5$ $y = 11.25$ | 4 | M1 a correct expression for x involving ratios of sides, e.g. $\frac{x}{5} = \frac{2}{4}$ oe A1 cao M1 $\frac{y}{x+5} = \frac{9}{6}$ or $\frac{y}{9} = \frac{x+5}{6}$ oe A1 cao OR $\frac{y}{5} = \frac{9}{4}$ A1 cao |
| Total for Question: 4 marks | | | | |

| 1MA0/1H | | | | | |
|----------|---------|----------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Question | Working | Answer | Mark | Additional Guidance | |
| 12. | (a) | $\frac{4}{16}$ | 3 | M1 Attempts to list all outcome pairs A1 all 16 found A1 cao OR M2 $\frac{1}{4} \times \frac{1}{4} \times 4$ (M1 $\frac{1}{4} \times \frac{1}{4} \times 1, 2$ or 3) A1 $\frac{4}{16}$ oe | |
| | (b) | $\text{Prob Ali wins} = \frac{6}{16}$ $\text{Number of wins} = \frac{6}{16} \times 80$ | 30 | 3 | B1 Prob Ali wins = $\frac{6}{16}$ oe M1 $\frac{6}{16} \times 80$ A1 ft |
| | | | | Total for Question: 6 marks | |

| 1MA0/1H | | | | | |
|----------|-----|-------------------------------------------------------|----------------------|------|-------------------------------------------------------------------------|
| Question | | Working | Answer | Mark | Additional Guidance |
| 13. | (a) | | 3.4×10^{-7} | 1 | B1 cao |
| | (b) | $2.4 \times 10^{12} \times \frac{5}{100} (\div 10^6)$ | 1.2×10^5 | 2 | M1 $2.4 \times 10^{12} \times \frac{5}{100}$ oe $(\div 10^6)$ A1 cao |
| | | | | | Total for Question: 3 marks |

| 1MA0/1H | | | | |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | Working | Answer | Mark | Additional Guidance |
| 14. | <p>Let $AB = x, AD = y$ Area of rectangle = xy Area $AXD = \frac{xy}{4}$ Area $CYZ = \frac{xy}{8}$ Shaded area = $\frac{5xy}{8}$</p> | $\frac{5}{8}$ | 4 | <p>M1 a full method to find the unshaded area and subtracting from 1 B1 area of $AXD = \text{area of } ABCD \div 4$ B1 area of $CYZ = \text{area of } ABCD \div 8$ A1 cao OR Diagram M1 for dividing left into 2 congruent triangles for dividing right into 4 congruent triangles B1 left = $2A$ and $2A$ or shaded = $\frac{1}{2}$ of $\frac{1}{2} = \frac{1}{4} = \frac{2}{8}$ B1 right = $2A$ and A and A or shaded = $\frac{3}{4}$ of $\frac{1}{2} = \frac{3}{8}$ A1 cao Substitution M1 for deciding upon suitable side lengths for AD and AB and calculating dimensions of internal shapes B1 for area of DZX B1 for area of $ZXBY$ A1 cao OR M1 for deciding upon suitable side lengths for AD and AB and calculating dimensions of internal shapes B1 for area ADX B1 for area ZCY A1 cao</p> |
| | | | | Total for Question: 4 marks |

| 1MA0/1H | | | | |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------|----------------------------------------------------------------------------------------------------------|
| Question | Working | Answer | Mark | Additional Guidance |
| 15. | (a) (i) $\vec{BC} = \vec{CO} + \vec{OB}$ | $12\mathbf{a} - 4\mathbf{b}$ | 4 | M1 $\vec{BC} = \vec{CO} + \vec{OB}$ A1 cao |
| | (ii) $\vec{AQ} = \vec{AO} + \vec{OB} + \vec{BQ}$ $= -4\mathbf{a} + 4\mathbf{b} + \frac{1}{4}(12\mathbf{a} - 4\mathbf{b})$ | $3\mathbf{b} - \mathbf{a}$ | | M1 $-4\mathbf{a} + 4\mathbf{b} + \frac{1}{4}$ '(12a - 4b)' A1 cao |
| | (b) $\vec{OX} = 12\mathbf{b}$, $\vec{AX} = -4\mathbf{a} + 12\mathbf{b}$ $= 4(-\mathbf{a} + 3\mathbf{b})$ | Correct reason, with correct working | 3 | B1 $\vec{OX} = 12\mathbf{b}$ B1 $\vec{AX} = -4\mathbf{a} + 12\mathbf{b}$ C1 convincing explanation |
| Total for Question: 7 marks | | | | |

| 1MA0/1H | | | | |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | Working | Answer | Mark | Additional Guidance |
| 16. | $\frac{4}{10} \times \frac{6}{9} \times \frac{5}{8} = \frac{120}{720}$ $\frac{120}{720} + \frac{6}{10} \times \frac{5}{9} \times \frac{4}{8} +$ $\frac{6}{10} \times \frac{4}{9} \times \frac{5}{8}$ | $\frac{360}{720}$ | 4 | <p>M1 for $\frac{4}{10} \times \frac{6}{9} \times \frac{5}{8}$</p> <p>A1 for $\frac{120}{720}$ oe</p> <p>M1 $\frac{120}{720}$ + 2 correct cases (M1 any 2 correct cases)</p> <p>or $\frac{120}{720} \times 3$</p> <p>A1 cao</p> <p>SC with replacement</p> <p>M1 $\frac{4}{10} \times \frac{6}{10} \times \frac{6}{10}$</p> <p>M1 $\frac{4}{10} \times \frac{6}{10} \times \frac{6}{10} \times 3$</p> |
| | | | | Total for Question: 4 marks |
| 17. | $\frac{(3x+5)(x-7)}{(3x-5)(3x+5)}$ | $\frac{x-7}{3x-5}$ | 3 | <p>B1 $(3x+5)(x-7)$</p> <p>B1 $(3x-5)(3x+5)$</p> <p>B1 $\frac{x-7}{3x-5}$</p> |
| | | | | Total for Question: 3 marks |

| 1MA0/1H | | | | | |
|------------------------------------|-----|-----------------------------------------------------------------------------------|--------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | | Working | Answer | Mark | Additional Guidance |
| 18. | (a) | | $\frac{1}{2}$ | 1 | B1 |
| | (b) | $(2 + \sqrt{3}) \times (1 + \sqrt{3})$ $= 2 + 2\sqrt{3} + \sqrt{3} + \sqrt{9}$ | $5 + 3\sqrt{3}$ | 2 | M1 4 term expansion with 3, 4 terms correct and sight of 3 or $\sqrt{9}$ A1 cao |
| Total for Question: 3 marks | | | | | |
| 19. | (a) | | Smooth curve | 2 | B1 correct plot of their values B1 smooth curve through their points |
| | (b) | | $x = 3$ $y = 0$ | 3 | M1 attempts to draw circle at origin M1 uses radius 3 cm (using graph scale correctly) A1 cao OR B1 for substituting a value of x into $y = x(x - 3)$ and $x^2 + y = r^2$ B1 for substituting y into $x = 3$ into $x(x - 3)$ and $x^2 + y = r^2$ B1 cao |
| Total for Question: 5 marks | | | | | |

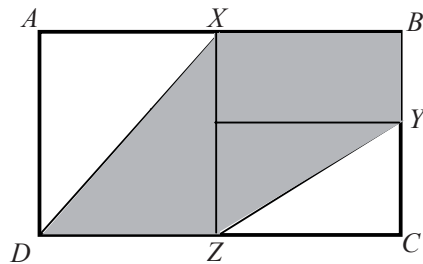
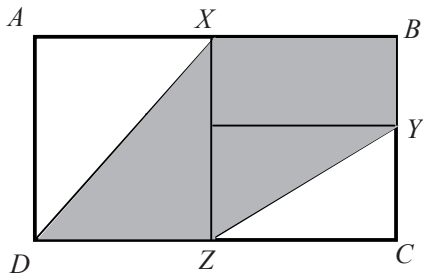
| 1MA0/1H | | | | |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Question | Working | Answer | Mark | Additional Guidance |
| 20. QWC ii, iii | $(2n + 1)^2 - (2n - 1)^2$ $=$ $4n^2 + 4n + 1 - (4n^2 - 4n + 1)$ $= 8n$ OR $(2n + 1)^2 - (2n - 1)^2 =$ $((2n + 1) - (2n - 1))(2n + 1 + 2n - 1)$ $= 2 \times 4n = 8n$ | Fully algebraic argument, set out in a logical and coherent manner | 6 | <p>B2 the nth term for consecutive odd numbers is $2n - 1$ oe (B1 $2n + k$, $k \neq -1$ or $n = 2n - 1$ or $2x - 1$ B1 use of $2n + 1$ and $2n - 1$ oe M1 $(2n + 1)^2 - (2n - 1)^2$ M1 $4n^2 + 4n + 1 - (4n^2 - 4n + 1)$</p> <p>C1 conclusion based on correct algebra QWC: Conclusion should be stated, with correct supporting algebra.</p> <p>OR</p> <p>B1 use of $2n + 1$ and $2n - 1$ oe M1 $(2n + 1)^2 - (2n - 1)^2$ M1 $((2n + 1) - (2n - 1))(2n + 1 + 2n - 1)$</p> <p>C1 conclusion based on correct algebra QWC: Conclusion should be stated, with correct supporting algebra.</p> |
| | | | | Total for Question: 6 marks |

| 1MA0/1H | | | | | | | | |
|------------------------------------|---------|-------|----|-----|------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Question | Working | | | | Answer | Mark | Additional Guidance | |
| 21. | | | | | Histogram OR Cumulative Frequency polygon 82% | 6 | B1 Scales labelled and also marked on the vertical axis with frequency density or with cumulative frequency M1 frequency densities calculated, at least one non-trivial one correct. A1 all correctly plotted (M1 cumulative frequencies correct) M1 Use 50 on the horizontal scale of CF diagram read off vertical axis (200-210) or Use 50 on the horizontal scale of a histogram and covert area to the left to a frequency M1 convert to a percentage A1 80 – 85 | |
| | | L | F | FD | | | | CF |
| | | 0–10 | 40 | 4 | | | | 40 |
| | | 10–20 | 60 | 6 | | | | 100 |
| | | 20–40 | 90 | 4.5 | | | | 190 |
| | | 40–80 | 60 | 1.5 | | | | 250 |
| | >80 | 0 | 0 | 250 | | | | |
| Total for Question: 6 marks | | | | | | | | |

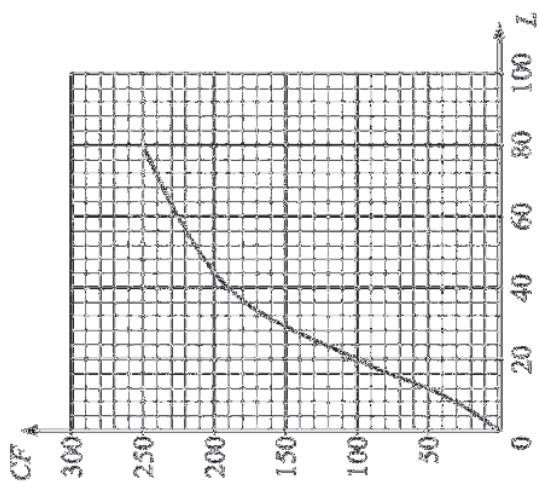
2.

| | Fraction | Decimal | % | kg |
|-----|------------------|---------|-------|-----------|
| Jan | $\frac{1}{10}$ | 0.1 | 10% | Not known |
| Feb | $\frac{1}{8}$ | 0.125 | 12.5% | 15 kg |
| Mar | $\frac{13}{100}$ | 0.13 | 13% | 14.56 kg |

14.



21.



OR

