

GCSE Mathematics (1MA1) – Aiming for Grade 5 1F

Student-friendly mark scheme

Please note that this mark scheme is not the one used by examiners for marking scripts. It is intended more as a guide to good practice, indicating where marks are given for correct answers. As such, it doesn't show follow-through marks (marks that are awarded despite errors being made) or special cases.

It should also be noted that for many questions, there may be alternative methods of finding correct solutions that are not shown here – they will be covered in the formal mark scheme.

Some questions require all working to be shown; in such questions, no marks will be given for an answer with no working (even if it is a correct answer).

The following table shows the marks scored on average at certain grades on similar questions from live exams.

For example: A student who achieved a Grade 5 on similar questions from either the Summer 2023 or November 2023 exam sittings achieved on average 24.8 marks from these questions.

Grade	5	4	3	2	1
Mark	24.8	12.6	7.0	3.7	1.9

Answer all questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

*1 Mano has three shelves of books.

There are x books on shelf **A**.

There are $(3x + 1)$ books on shelf **B**.

There are $(2x - 5)$ books on shelf **C**.

There is a total of 44 books on the three shelves.

All the books have the same mass.

The books on shelf **B** have a total mass of 7500 g.

Work out the total mass of the books on shelf **A**.

A	B	C	Total
x	$3x + 1$	$2x - 5$	$= 44$

1 mark

$$6x - 4 = 44$$

$$6x = 48$$

$$x = 8$$

Shelf B $3x + 1$

1 mark

$$3 \times 8 + 1 = 25 \text{ books}$$

$$25 \text{ books} = 7500 \text{ g}$$

$$\begin{aligned} 1 \text{ book} &= 7500 \div 25 \\ &= 300 \text{ g} \end{aligned}$$

1 mark

Shelf A

$$8 \times 300$$

1 mark

2400

Final mark

g

(Total for Question 1 is 5 marks)

*2 The mean length of 5 sticks is 4.2 cm.

Nawal measured the length of one of the sticks as 7 cm.

(a) Work out the mean length of the other 4 sticks.

Total length $4.2 \times 5 = 21$ 1 mark

$21 - 7 = 14$ $14 \div 4 = 3.5$ 1 mark

3.5 Final mark cm
(3)

Nawal made a mistake.

The stick was not 7 cm long.

It was 17 cm long.

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

$21 - 17 = 4$ $4 \div 4 = 1 \text{ cm}$
My answer would be smaller than 4 1 mark

(1)

(Total for Question 2 is 4 marks)

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

$6x^2 - 15x + 4x - 10$

1 mark

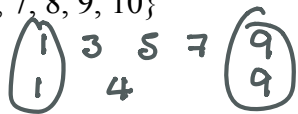
$6x^2 - 11x - 10$ Final mark
(2)

(b) Factorise $x^2 - 16$

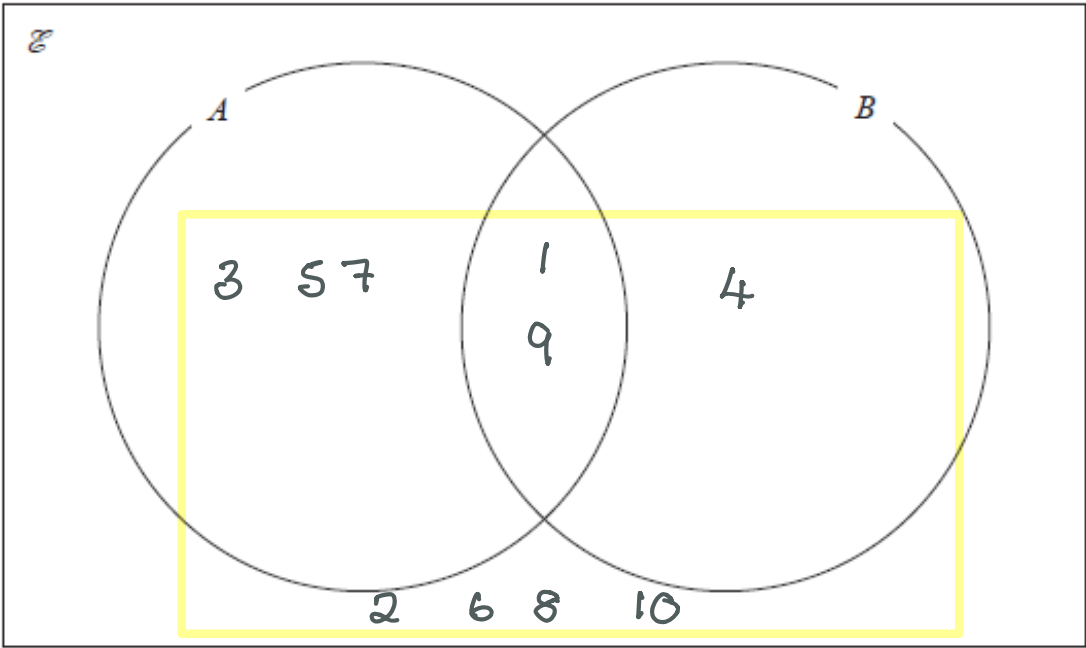
$(x + 4)(x - 4)$ 1 mark
(1)

(Total for Question 3 is 3 marks)

*4 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
 $A = \{\text{odd numbers}\}$
 $B = \{\text{square numbers}\}$



(a) Complete the Venn diagram for this information.



3 marks for fully correct Venn

2 marks for two or three correct regions

1 mark for one correct region

(3)

A number is chosen at random from the universal set $\mathcal{E}$
 (b) Find the probability that this number is in the set B'

$$\frac{7}{10}$$

1 mark for denominator of 10

$$\frac{7}{10}$$

Final mark

(2)

(Total for Question 4 is 5 marks)

*5 (i) Write down the value of 5^0

$$1$$

1 mark

(1)

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

$$\frac{1}{5^2} = \frac{1}{25}$$

$$\frac{1}{25}$$

1 mark

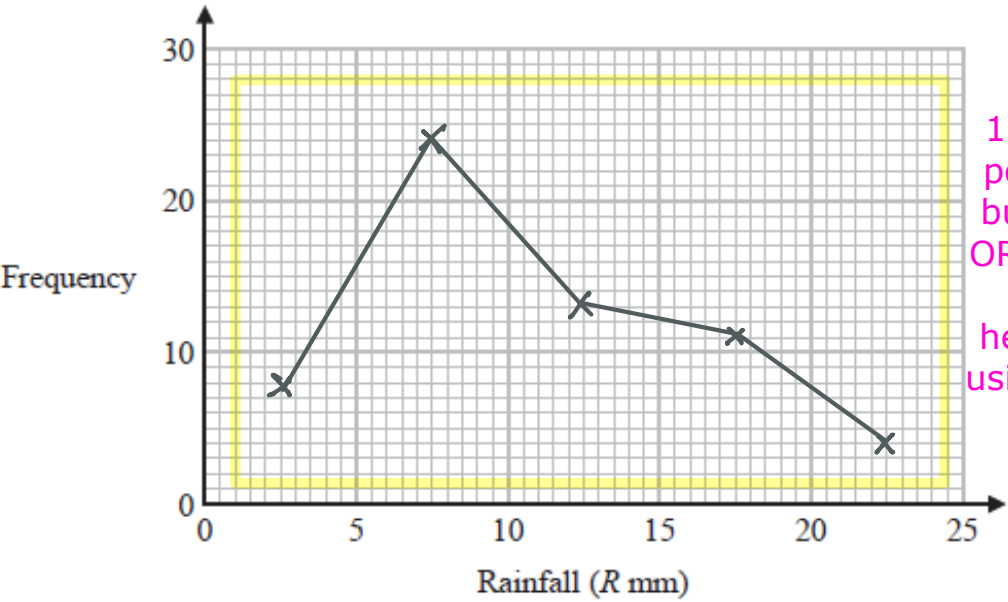
(1)

(Total for Question 5 is 2 marks)

***6** The table shows information about the daily rainfall in a town for 60 days.

Rainfall (R mm)	Frequency
$0 \leq R < 5$	8
$5 \leq R < 10$	24
$10 \leq R < 15$	13
$15 \leq R < 20$	11
$20 \leq R < 25$	4

Draw a frequency polygon for this information.

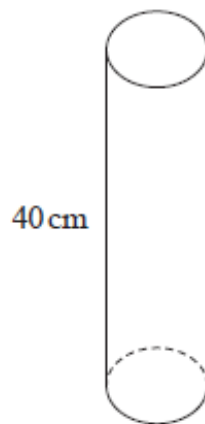


2 marks for fully correct frequency polygon

1 mark for all points plotted but not joined OR all points at the correct height but not using midpoints and joined

(Total for Question 6 is 2 marks)

*7 The diagram shows a solid cylinder on a horizontal floor.



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

1 mark

The cylinder has a

volume of 1200 cm^3
height of 40 cm .

$$\text{Area} = \frac{1200}{40} = 30 \text{ cm}^2$$

The cylinder exerts a force of 90 newtons on the floor.

Work out the pressure on the floor due to the cylinder.

$$F = 90 \text{ N}$$

$$A = 30 \text{ cm}^2$$

$$P = ?$$

$$P = \frac{90}{30}$$

1 mark

3

Final mark

newtons/cm²

(Total for Question 7 is 3 marks)

*8 Work out $8.46 \div 0.15$

$$\frac{8.46}{0.15} \times \frac{100}{100} = \frac{846}{15}$$

$$846 \div 15$$

1 mark

$$056.4$$

1 mark for digits 564

$$15 \overline{) 846.600}$$

15
30
45
60
75
90
105
120

56.4

Final mark

(Total for Question 8 is 3 marks)

- 9 Work out an estimate for $\frac{5.7 \times 8.2}{0.26}$

1 mark for
one of these

$$\begin{array}{l} 5.7 \rightarrow 6 \\ 8.2 \rightarrow 8 \\ 0.26 \rightarrow 0.25 \end{array}$$

$$\frac{6 \times 8}{0.25} = \frac{48}{0.25}$$

$$48 \div \frac{1}{4} = 48 \times 4$$

1 mark

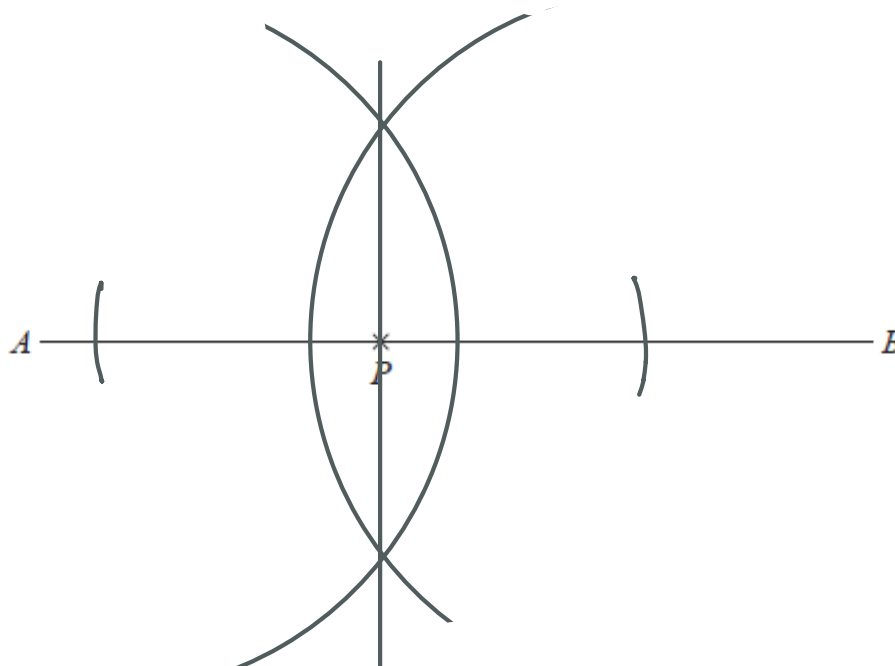
0.3 could be used too so
a range is accepted of
160 to 200

192

Final mark

(Total for Question 9 is 3 marks)

- *10 The point P lies on the line AB .
Use ruler and compasses to construct an angle of 90° at P .
You must show all your construction lines.



2 marks

(Total for Question 10 is 2 marks)

*11 A cube has a total surface area of 150 cm^2

Work out the volume of the cube.

1 face = $150 \div 6 = 25 \text{ cm}^2$ 1 mark

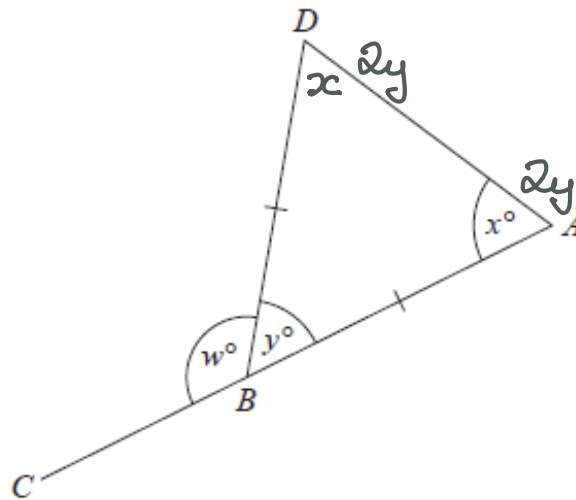
side length = $\sqrt{25} = 5 \text{ cm}$ 1 mark

Volume = $5 \times 5 \times 5$ 1 mark

Final mark
125 cm^3

(Total for Question 11 is 4 marks)

*12 The diagram shows an isosceles triangle ABD and the straight line ABC .



$BA = BD$

$x : y = 2 : 1$

Work out the value of w .

using $x : y = 2 : 1$

$x = 2y$ 1 mark

so $180^\circ = 5y$ 1 mark

$y = 180 \div 5$
 $= 36$

$$\begin{array}{r} 036 \\ 5 \overline{)180} \end{array}$$

$w = 180 - 36$ 1 mark

Final mark
 $w = 144$

(Total for Question 12 is 4 marks)

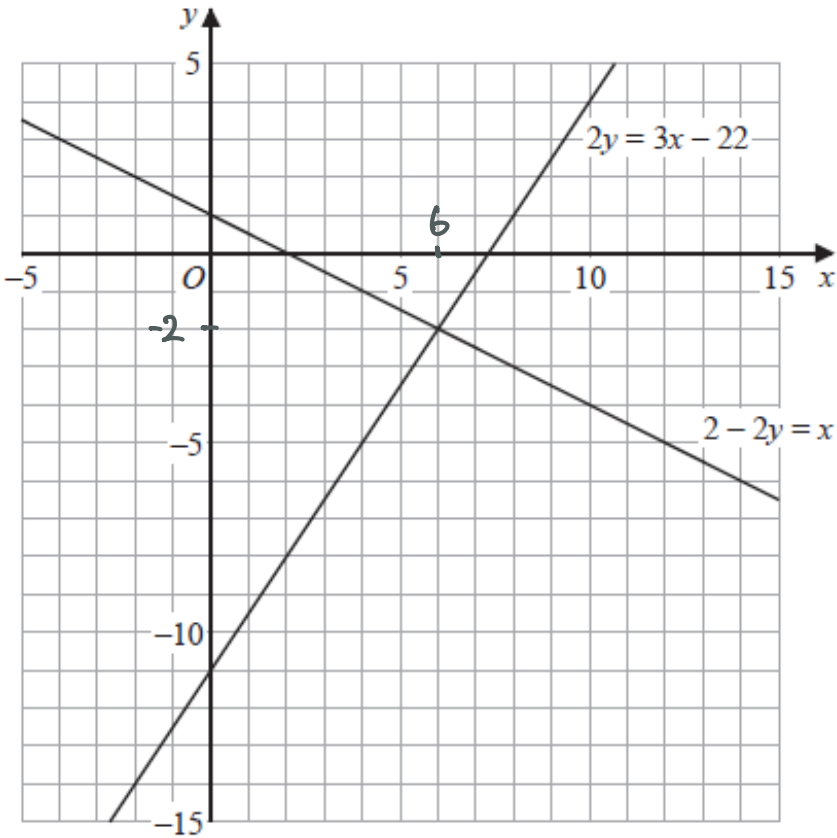
13 Work out the value of $\frac{4^{-6} \times 4^9}{4}$

1 mark $\frac{4^{-6+9}}{4} = \frac{4^3}{4}$
 $= 4^2 = 16$

16 (or 4^2) Final mark

(Total for Question 13 is 2 marks)

*14



Use these graphs to solve the simultaneous equations

$$\begin{aligned} 2 - 2y &= x \\ 2y &= 3x - 22 \end{aligned}$$

x = 6 1 mark
y = -2

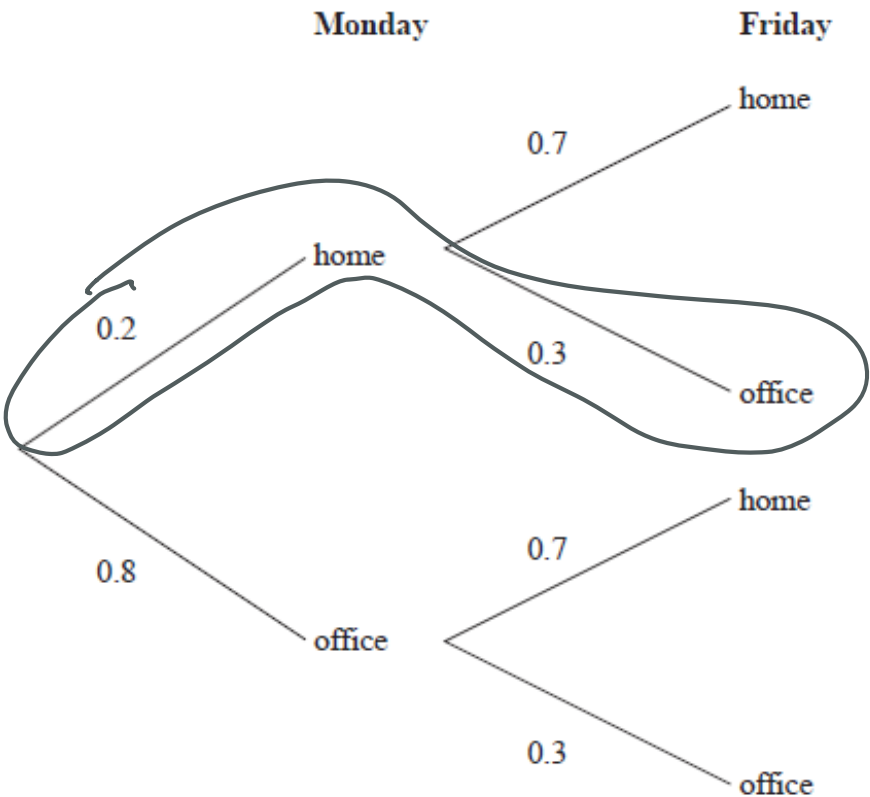
(Total for Question 14 is 1 mark)

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

1 mark $\frac{1}{2}$ or 0.5

(Total for Question 15 is 1 mark)

16 The probability tree diagram shows the probabilities that Shayla will work at home or will work at the office on two days next week.



Work out the probability that Shayla will work at home on Monday and work at the office on Friday.

0.2×0.3 1 mark

0.06 Final mark

(Total for Question 16 is 2 marks)

TOTAL FOR PAPER IS 46 MARKS