GCSE Mathematics (1MA1) – Aiming for Grade 4 3F

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 4 on similar questions from either the Summer 2023 or November 2023 exam sittings achieved on average 26.4 marks from these questions**.**

Grade	**5**	**4**	**3**	**2**	**1**
Mark	35.4	26.4	17.3	9.6	4.3

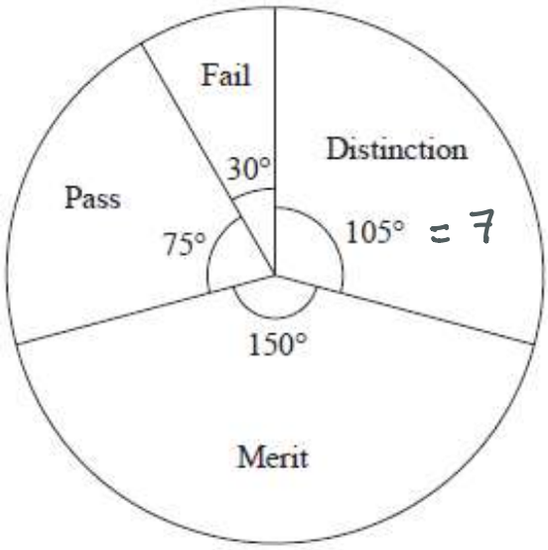
Answer all questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Some students took a guitar exam.

The pie chart shows information about the grades the students got.



(*a*) Write down the modal grade.

merit 1 mark

.....

(1)

7 students got distinction.

(*b*) Work out the total number of students who took the guitar exam.

7 people = 105°

1 person = 105 ÷ 7
= 15°

1 mark

360 ÷ 15 = 24

1 mark

24 Final mark

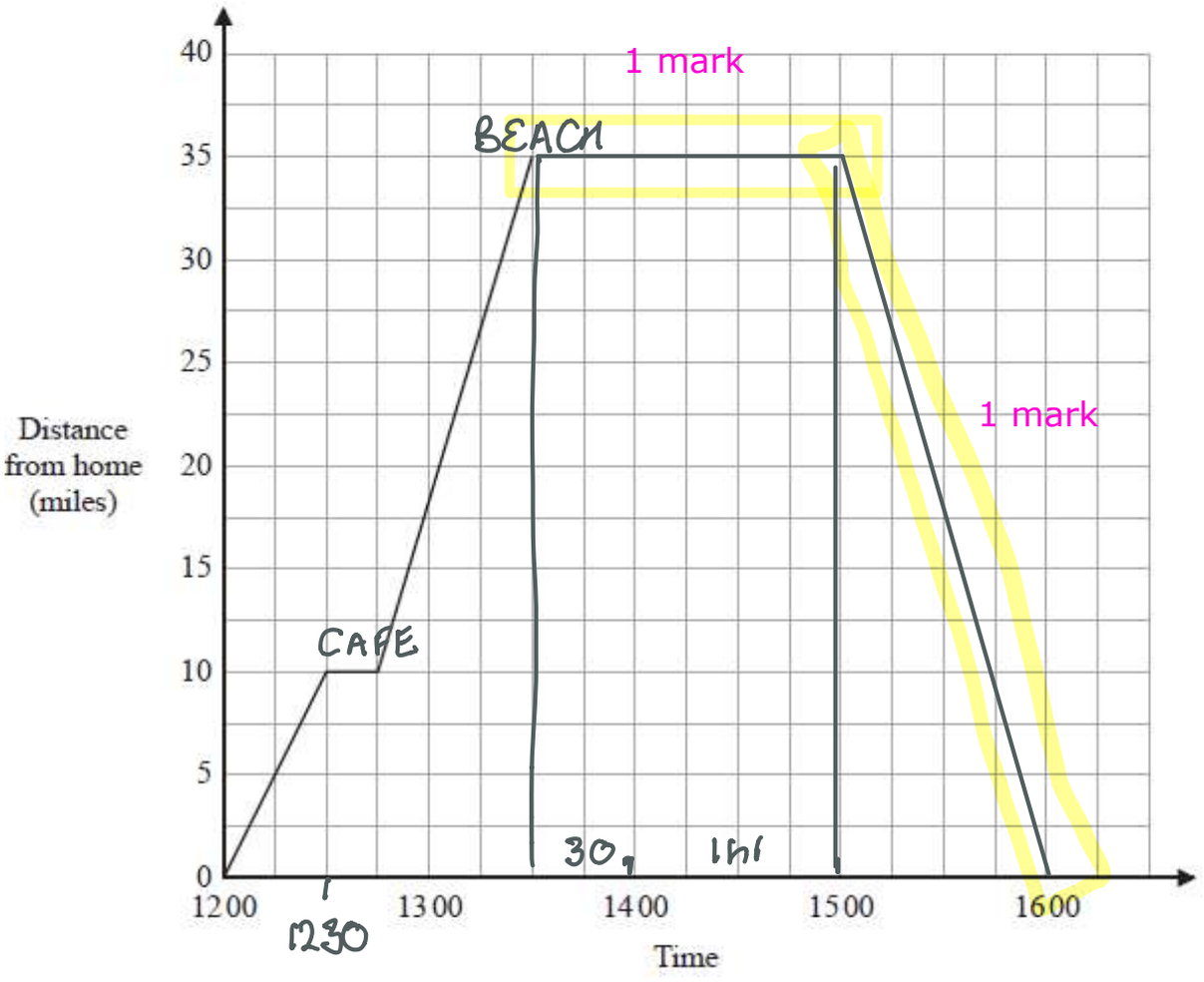
.....

(3)

(Total for Question 1 is 4 marks)

2 Rowena drove from her home to a beach.

Here is a travel graph for her journey.



Rowena stopped at a cafe on her way to the beach.

(*a*) (i) How many minutes did Rowena take to drive to the cafe?

30 1 mark ..... minutes

(1)

(ii) Write down the distance from Rowena's home to the cafe.

10 1 mark ..... miles

(1)

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

She then drove home without stopping.
Rowena arrived home at 16 00

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

(2)

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

1 hour = 35 miles

35 1 mark

..... miles per hour

(1)

(Total for Question 2 is 5 marks)

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3 Write down the value of the 9 in the number 27.963

1 mark for any of these $\frac{9}{10}$, 0.9 or tenths.

(Total for Question 3 is 1 mark)

***4** (*a*) Simplify $(m^2)^3$

m^6 1 mark

(1)

(*b*) Simplify $x^5 \times x^8$

x^{13} 1 mark

(1)

(*c*) Expand $4p(p^2 + 3p)$

$4p \times p^2 = 4p^3$

$4p \times 3p = 12p^2$

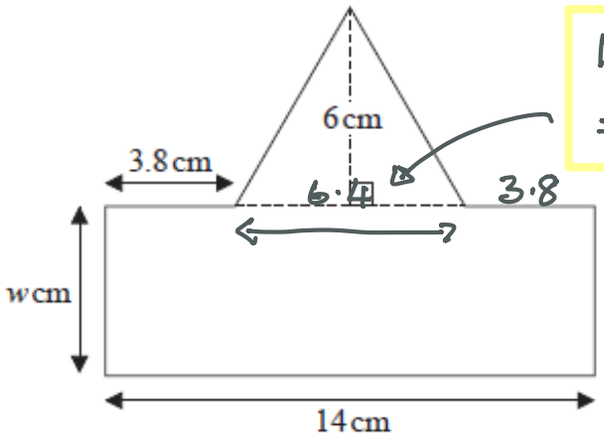
1 mark for either of these

$4p^3 + 12p^2$ Final mark

(2)

(Total for Question 4 is 4 marks)

5 Here is a shape made from a rectangle and a triangle.



14 − (3·8 + 3·8)
= 6·4

1 mark

The shape has exactly one line of symmetry.

The area of the rectangle is 3.5 times the area of the triangle.
The width of the rectangle is w cm.

Work out the value of w.
You must show all your working.

rectangle = 3·5 × triangle

$14 \times w = 3.5 \times \frac{1}{2} \times 6.4 \times 6$ 1 mark

$14w = 3.5 \times 19.2$ 1 mark

$14w = 67.2$ 1 mark

$w = \frac{67.2}{14}$

$w =$ 4·8 Final mark

(Total for Question 5 is 5 marks)

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6 Solve $\frac{x}{7} + 9 = 4$

$\frac{x}{7} + 9 = 4$
$\quad -9 \quad -9$

$\frac{x}{7} = -5$ 1 mark
$\times 7 \quad \times 7$

$x = -35$

$x =$ −35 Final mark

(Total for Question 6 is 2 marks)

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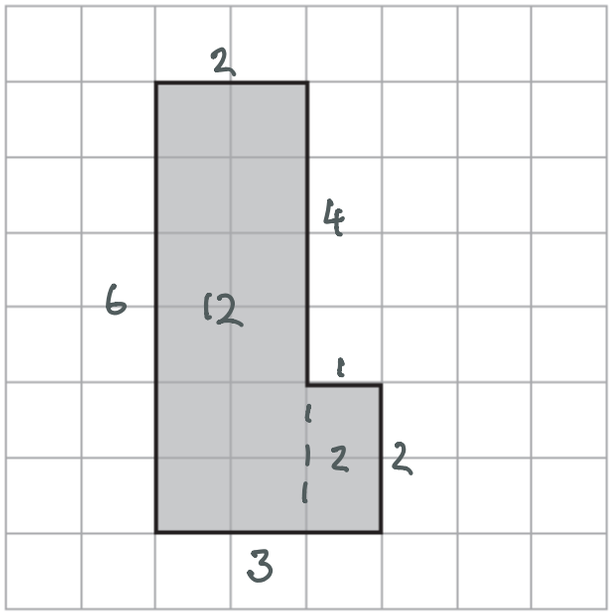
7 The diagram shows a shape on a centimetre grid.



(*a*) Find the area of the shape.

14 1 mark ..... cm^2

(1)

(*b*) Find the perimeter of the shape.

18 1 mark ..... cm

(1)

(Total for Question 7 is 2 marks)

***8** (*a*) Write 468 000 in standard form.

4.68×10^5 1 mark .....

(1)

(*b*) Write 5.037×10^{-4} as an ordinary number.

0.0005037 1 mark .....

(1)

(Total for Question 8 is 2 marks)

***9** Riley travelled by car and by aeroplane.

He travelled 143 miles by car at an average speed of 55 miles per hour.
Riley then travelled for 5 hours and 20 minutes by aeroplane.

Work out, in hours and minutes, Riley's total travelling time.

55 miles = 1 hour = 60 mins 1 mark

÷ 55 ÷ 55

× 143 × 143

143 miles = 156 mins 1 mark

156 mins = 2 hrs 36 mins

Total time = 2hr 36 mins + 5hrs 20mins

7 hours 56 minutes Final mark

(Total for Question 9 is 3 marks)

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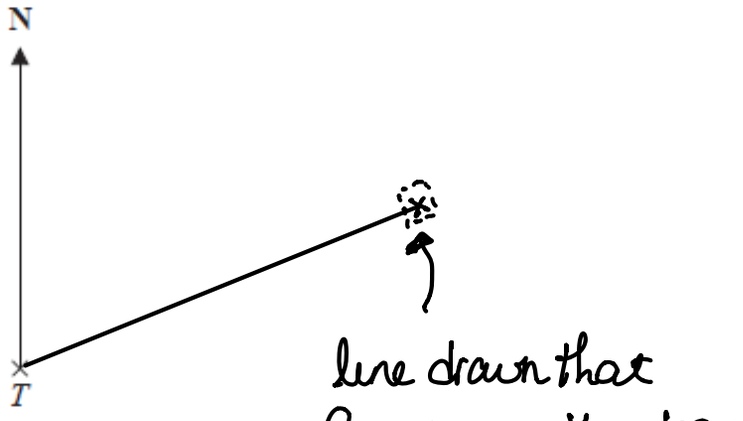
10 The diagram shows the position of town *T*.



1 mark for a line 5.3 to 5.7 cm away from T in any direction

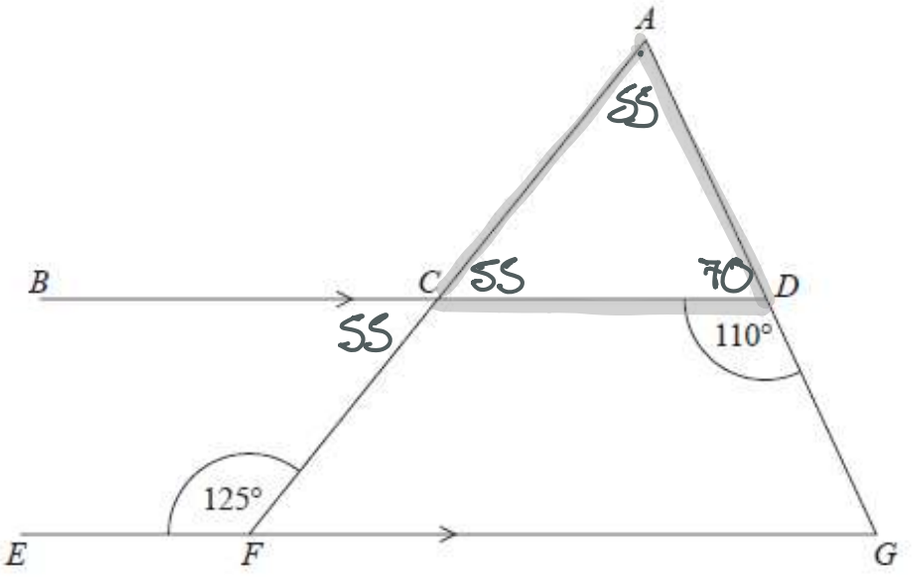
1 mark for a line of any length on the same angle ie 65 degrees (+\- 2 degrees) as the line above)

Town *R* is 55 km from town *T* on a bearing of 065°

Mark the position of town *R* with a cross (×).
Use a scale of 1 cm to 10 km.

(Total for Question 10is 2 marks)

***11** *ACF* and *ADG* are straight lines.
BCD and *EFG* are parallel lines.



Show that triangle *ACD* is isosceles.
Give a reason for each stage of your working.

$\angle ADC = 70°$ $180 - 110 = 70$ 1 mark

angles on a straight line = 180

$\angle BCF = 180 - 125 = 55$ 1 mark

Also 1 mark for a reason linked to parallel lines

AND

1 mark for another valid reason

contenor angles add up to 180°

$\angle ACD = \angle BCF = 55$

vertically opposite angles are equal

$\angle CAD = 180 - (55 + 70) = 55$ 1 mark

so triangle ACD is isosceles as two angles are equal.

(Total for Question 11 is 5 marks)

***12** A company orders a large number of plates from a factory.
It would take 30 hours to make all the plates using 4 machines.

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

30 hours = 4 machines
÷5 x5 1 mark
6 hours = 20 machines

inverse proportion!

20 Final mark

.....

(Total for Question 12 is 2 marks)

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13 Write $(9 \times 10^4) : (4.5 \times 10^6)$ in the form $1 : n$ where n is an integer.

90000 : 4,500,000 1 mark

9 : 450
÷9 ÷9
1 : 50

1 : 50 Final mark

.....

(2)

(Total for Question 13 is 2 marks)

***14** A solid cuboid is made of metal.

The metal has a density of 9 g/cm^3
The volume of the cuboid is 72 cm^3

Work out the mass of the cuboid.

Density = $\frac{\text{mass}}{\text{volume}}$

mass = 72 x 9 1 mark

648 Final mark

..... g

(Total for Question 14 is 2 marks)

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15 Jenny invests £3000 for 6 years at y% simple interest per year.

At the end of the 6 years, Jenny has received a total of £450 in interest.

Work out the value of y.

1 mark

$450 \div 6 = 75$ per year

1 mark

$\frac{75}{3000} \times 100 = 2.5$

$y =$ 2.5 Final mark

(Total for Question 15 is 3 marks)

TOTAL FOR PAPER IS 44 MARKS