Write your name here

Surname	Other names

Edexcel GCSE

Centre Number	Candidate Number

Mathematics A

Paper 2 (Calculator)

Higher Tier

Sample Assessment Material
Time: 1 hour 45 minutes

Paper Reference
1MA0/2H

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. 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 may be used**.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.



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.

Turn over ▶

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2/2/2/2/3/2

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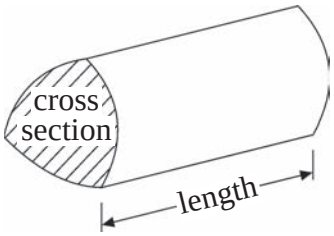
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GCSE Mathamatics 1MA0

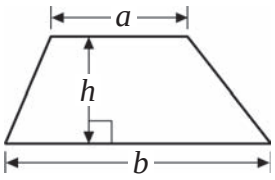
Formulae – Higher Tier

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 × length

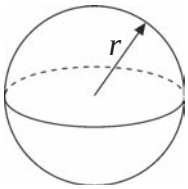


Area of trapezium = $\frac{1}{2}(a+b)h$



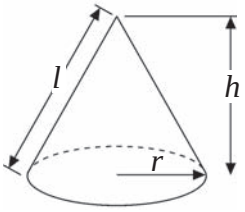
Volume of sphere = $\frac{4}{3}\pi r^3$

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

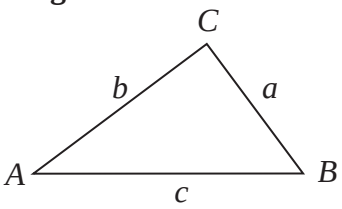


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = πrl



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 = $\frac{1}{2}ab\sin C$

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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1 Peter won £75 as a prize.

He gave $\frac{4}{5}$ of the prize money as a present to Roger and Bethan.

Roger and Bethan shared the present in the ratio 2:3

Work out how much they each got.

Roger .....

Bethan .....

(Total for Question 1 = 4 marks)

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2 The equation $x^3 - 5x = 60$ has a solution between 4 and 5

Find this solution and give your answer correct to 1 decimal place.
You must show **all** your working.

$x =$ .....

(Total for Question 2 = 4 marks)

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3

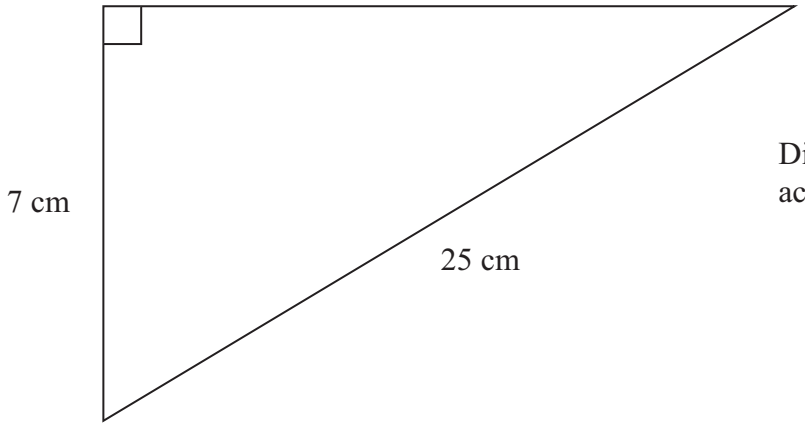


Diagram **NOT** accurately drawn

Calculate the area of this right-angled triangle.

.....

(Total for Question 3 = 4 marks)

4 Imran wants to work out how much tax he needs to pay.

Last year he earned £18 000

He does not pay Income tax on the first £6475 he earned.
He pays tax of 20 pence for each pound he earned above £6475

He pays the tax in two equal half-yearly instalments.

***(a)** How much Income tax does Imran have to pay in his first half-yearly instalment?

(4)

.....

Imran wants to know what percentage of his earnings he pays in tax.

(b) Calculate the Income tax Imran has to pay as a percentage of his earnings last year.

(2)

..... %

(Total for Question 4 = 6 marks)

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5 Here is some information about the time, in minutes, it took the 21 teachers at a school to get to work on Monday.

13	18	20	35	45	34	44
23	33	12	46	21	22	17
22	31	23	8	15	22	10

(a) Draw an ordered stem and leaf diagram to show this information.

(3)

Roadworks near the school meant that the time to travel to school by every teacher on Tuesday was increased by 5 minutes.

(b) What was the median of the times on Tuesday?

(2)

..... minutes

(c) State whether the interquartile range of the times on Tuesday would be less, greater or the same as the interquartile range of the times on Monday.
Give a reason for your answer.

(1)

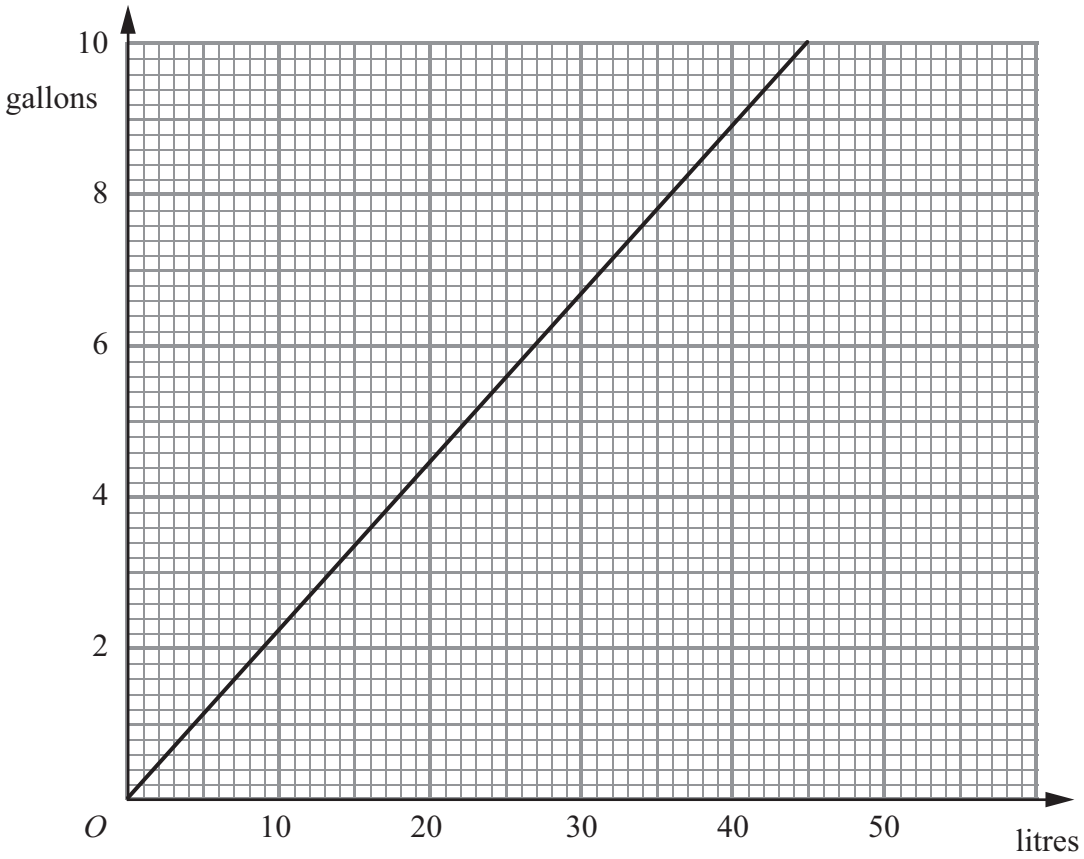
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.....

(Total for Question 5 = 6 marks)

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6 The graph can be used to convert between gallons and litres.



The diagram shows a central heating oil tank.



The oil tank is in the shape of a cylinder of length 180 cm and radius 60 cm.

The oil tank contains 200 gallons of oil.

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*(a) Is the oil tank more or less than $\frac{1}{2}$ full?

(5)

The oil has a density of 0.85 g/cm³.

(b) Work out, in kg, the mass of the oil in the tank.

(3)

..... kg

(Total for Question 6 = 8 marks)

7 The table shows information about the number of hours that 120 children used a computer last week.

Number of hours	Frequency
$0 < h \leqslant 2$	10
$2 < h \leqslant 4$	15
$4 < h \leqslant 6$	30
$6 < h \leqslant 8$	35
$8 < h \leqslant 10$	25
$10 < h \leqslant 12$	5

Work out an estimate for the mean number of hours that the children used a computer.
Give your answer to 2 decimal places.

(4)

..... cm

(Total for Question 7 = 4 marks)

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8 Fred and Jim pay Malcolm to do some gardening.

Fred has £x
Jim has ten pounds less than Fred.

Fred pays one third of his money to Malcolm.

Jim pays half of his money to Malcolm.

(a) Show that the amount that Malcolm is paid is $\frac{x}{3}+\frac{x-10}{2}$.

(1)

Malcolm is paid a total of £170

(b) Use algebra to show how much money Fred has left.

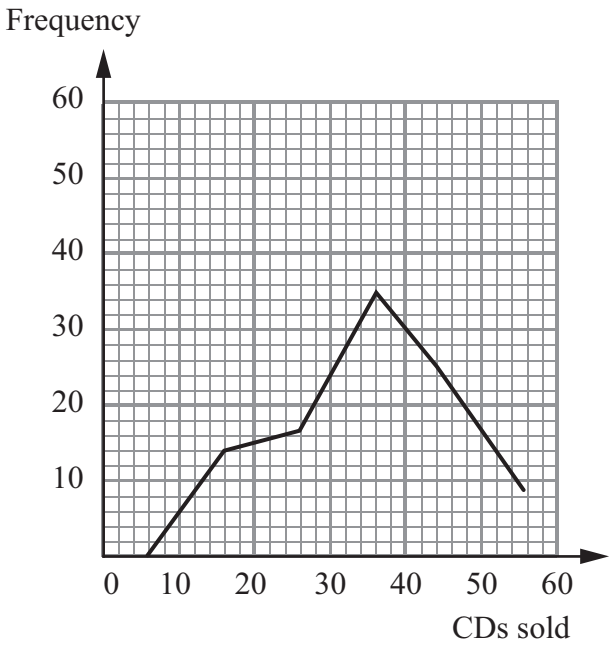
(4)

.....

(Total for Question 8 = 5 marks)

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***9** Kevin and Joe each manage a shop that sells CDs. Kevin's shop is in the High Street and Joe's is in the Retail Park.
They want to compare the sales of CDs in each of their shops for the first 100 days of the year.



Kevin's information about the number of CDs sold each day in the High Street shop is shown on the grid. Each class interval is 10 CDs wide.

Joe's information about the number of CDs sold each day in the Retail Park shop is shown in the table.

Number of CDs sold each day	**Frequency**
0 – 10	10
11 – 20	34
21 – 30	24
31 – 40	13
41 – 50	7
51 – 60	12

Compare the sales of CDs in the two shops.

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(Total for Question 9 = 4 marks)

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10 (a) Simplify fully

$(x^3)^{\frac{1}{2}} \times (x^2)^{\frac{1}{4}}$

(3)

.....

(b) Solve

$(x - 1)(x + 2) = 18$

(4)

.....

(c) Solve the simultaneous equations

$y = x^2 - 1$

$y = 5 - x$

(5)

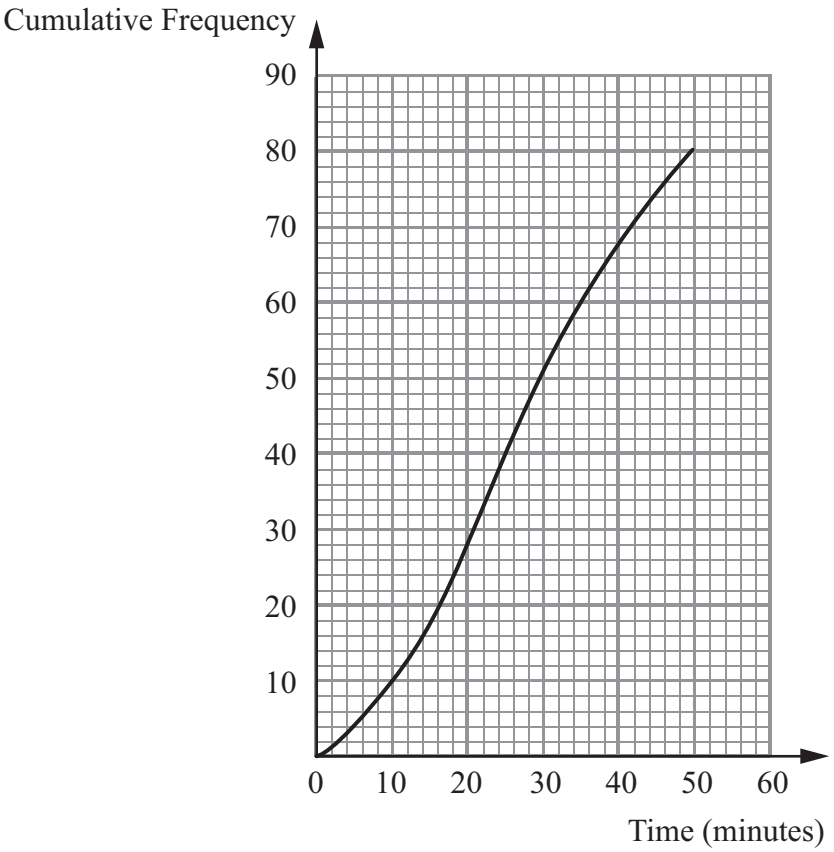
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.....

(Total for Question 10 = 12 marks)

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11 The cumulative frequency diagram gives information about the time, in minutes, 80 people were kept waiting at a hospital casualty department.



(a) Write down the number of people who waited for 20 minutes or less.

(1)

.....

(b) Work out an estimate of the number of people who waited for between 26 minutes and 40 minutes.

(2)

.....

The hospital has a target that no more than 15% of people are kept waiting for 40 minutes or more in the casualty department each day.

(c) Has the hospital achieved its target for the day?
You must explain your answer.

(2)

.....

.....

(Total for Question 11 = 5 marks)

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***12**

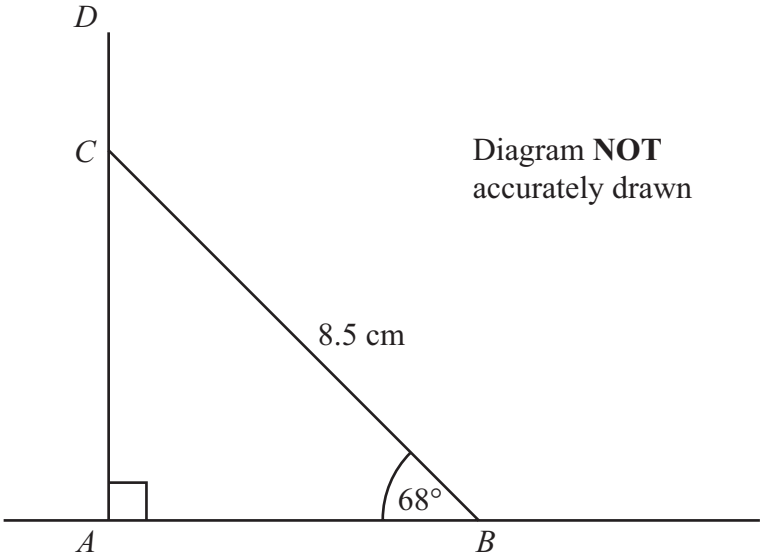


Diagram **NOT** accurately drawn

The diagram represents a vertical pole *ACD*.
AB is horizontal ground.
BC is a wire of length 8.5 metres.

The height of the pole *AD* is 9 metres.

For the pole to be correctly installed, the length *DC* has to be at least 1 metre.

Show that the pole has been correctly installed.

.....

(Total for Question 12 = 4 marks)

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13 The time, T seconds, for a hot sphere to cool is proportional to the square root of the surface area, A m^2, of the sphere.

When $A = 100$, $T = 40$.

Find the value of T when $A = 60$.

Give your answer correct to 3 significant figures.

..... seconds

(Total for Question 13 = 4 marks)

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14 The line $y = 2x + 3$ meets the line $y = 4x + 2$ at the point P.

Find an equation of the line which is perpendicular to the line $y = 2x + 3$ and which passes through the point P.

(5)

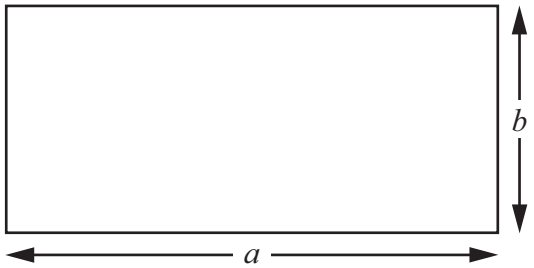
.....

(Total for Question 14 = 5 marks)

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15 Here is a rectangle.

Diagram **NOT** accurately drawn



a = 8.3 cm correct to 1 decimal place.
b = 3.6 cm correct to 1 decimal place.

(a) Calculate the upper bound of the area of this rectangle.
Write down all the figures on your calculator.

(2)

..... cm^2

(b) Find the area of this rectangle correct to an appropriate number of significant figures.

(2)

..... cm^2

(Total for Question 15 = 4 marks)

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16

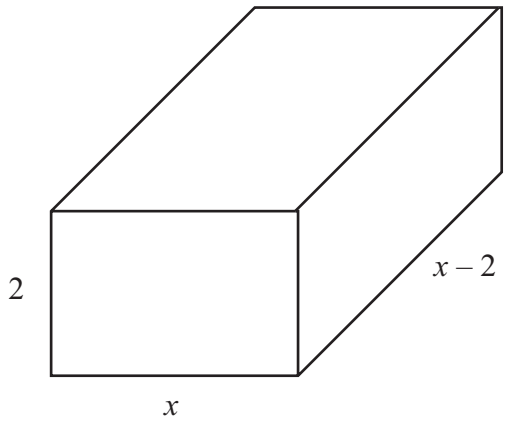


Diagram **NOT** accurately drawn

The diagram shows a cuboid.
All the measurements are in cm.

The volume of the cuboid is 51 cm^3.

(a) Show that $2x^2 - 4x - 51 = 0$ for $x > 2$

(4)

(b) Solve the quadratic equation

$$2x^2 - 4x - 51 = 0$$

Give your solutions correct to 3 significant figures.
You must show your working.

(3)

.....

.....

(Total for Question 16 = 7 marks)

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17

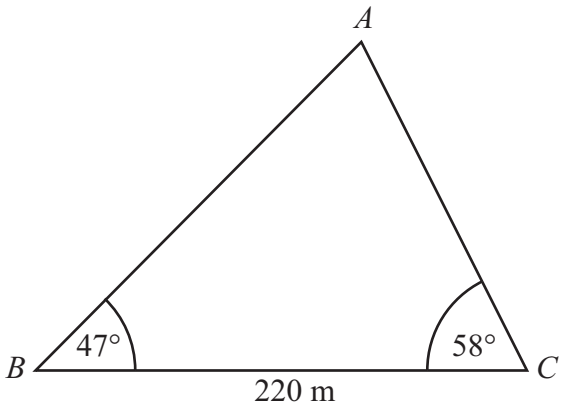


Diagram **NOT** accurately drawn

Angle *ABC* = 47°
Angle *ACB* = 58°
BC = 220 m

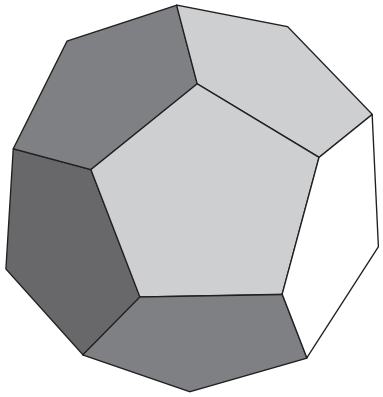
Calculate the area of triangle *ABC*.
Give your answer correct to 3 significant figures.

.....

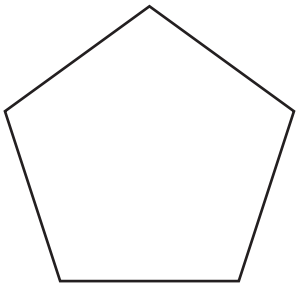
(Total for Question 17 = 5 marks)

18 Here is a regular dodecahedron.

A dodecahedron is a solid with 12 faces.



Each face is a regular pentagon.



Calculate the total surface area of a regular dodecahedron with edges of length 10 cm.

(Total for Question 18 = 9 marks)

TOTAL FOR PAPER = 100 MARKS

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