

1MA0/4H
Edexcel GCSE
Mathematics (Linear) – 1MA0
Practice Paper 4H (Calculator)
Set B



Higher Tier

Time: 1 hour 45 minutes

Materials required for examination

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

Items included with question papers

Nil

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.

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.

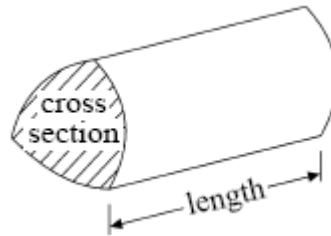
Check your answers if you have time at the end.

GCSE Mathematics (Linear) 1MA0

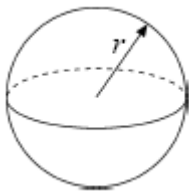
Formulae: Higher Tier

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

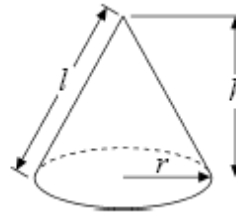
Volume of prism = area of cross section \times length



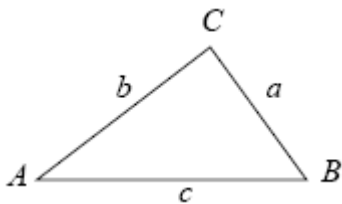
Volume of sphere $\frac{4}{3}\pi r^3$
Surface area of sphere $= 4\pi r^2$



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 TWENTY TWO questions

Write your answers in the spaces provided.

You may use a calculator in this paper.

You must write down all the stages in your working.

1. Here are the times, in minutes, taken to solve a puzzle.

5 10 15 12 8 7 20 35 24 15

20 33 15 24 10 8 10 20 16 10

(a) In the space below, draw a stem and leaf diagram to show these times.

(3)

(b) Find the median time to solve this puzzle.

..... mins

(1)

(Total 4 marks)

2. Mr and Mrs Ledger took their grandson Harry to Chic's Diner.

Chic's Diner			
Menu			
Starters		Deserts	
Prawn Cocktail	£4.50	Ice cream	£2.80
Pate and toast	£4.95	Apple pie	£3.20
Soup of the day	£3.50	Cheesecake	£3.50
Melon	£2.90		
Main course		Drinks	
Fish and chips	£7.85	White wine	£11.50 per
Steak and chips	£12.25	bottle	
Gammon and chips	£9.75	Red wine	£12.25 per
		bottle	
		Fruit juices	£2.10 per
Add 10% service charge			

Mr Ledger started with soup.

He had steak and chips for his main course and ice cream for desert.

Mrs Ledger started with a prawn cocktail and a main course of fish and chips.

She did not have a desert.

Harry didn't have a starter.

He had a main course of fish and chips and ice cream for desert.

Mr and Mrs Ledger shared a bottle of red wine.

Harry had a glass of fruit juice.

(a) Work out the total bill including the service charge.

£

(4)

Chic has now increased all of his prices by 6%.

(b) Work out the new price of fish and chips.

£

(3)

(Total 7 marks)

3. Here are the first five terms of an arithmetic sequence.

-2 1 4 7 10

(a) Find the 12th term of this sequence.

.....

(1)

(b) Write down, in terms of n , an expression for the n th term of this sequence.

.....

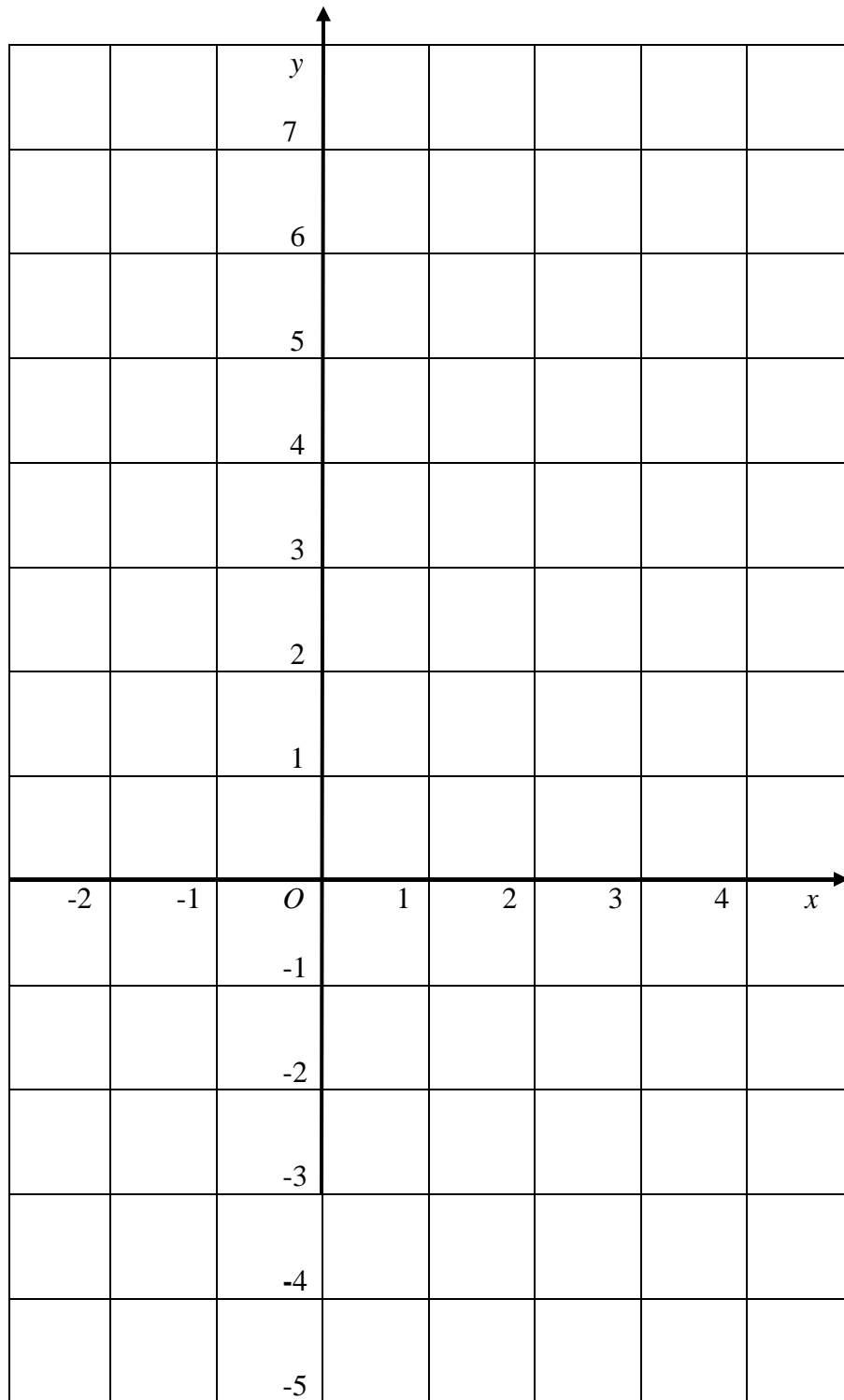
(2)

*(c) Prove that the number 432 is not a term in this sequence.

(2)

(Total 5 marks)

4. On the grid, draw the graph of $y = 3 - 2x$ from $x = -2$ to $x = 4$




(Total 3 marks)

*5. T-shirts normally cost £12 each.


Two shops have a special offer on these T-shirts.

T-Shirts-R-Us



Special offer
Pay for two T-shirts and get one free.
Pay for five T-shirts and get three free

Budget Shirt Company



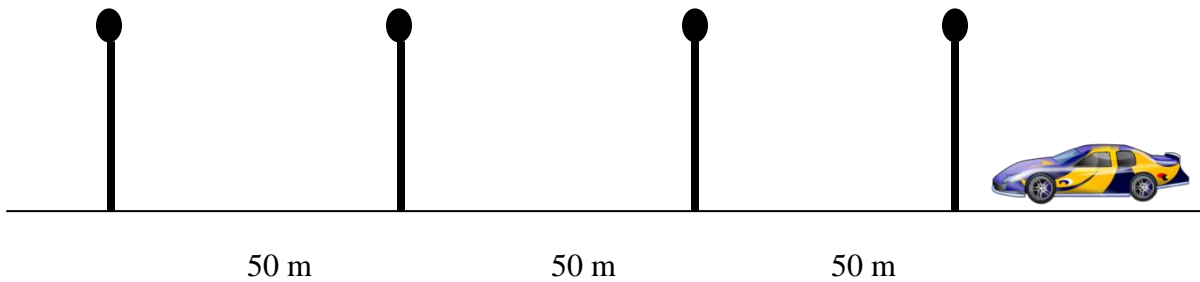
Special offer
 $\frac{1}{3}$ off normal price

Stephen wants to buy 30 T-shirts.

Work out at which shop, Stephen will get the better deal.
You must show clearly how you got your answer.

(Total 5 marks)

- *6. Roger lives in the village of Hawkshaw.
He wants to find out if cars break the speed limit through the village.



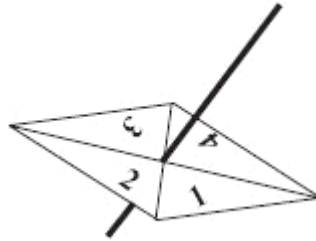
Roger times each car as it goes between four lampposts.
The distance between each lamppost is 50 m.

The speed limit through the village is 30 mph.
The first car Roger times takes 12 seconds to go between the four lampposts.

Is this car breaking the speed limit?
You must show all of your working.

(Total 5 marks)

7. Here is a 4-sided spinner.



The sides of the spinner are labelled 1, 2, 3 and 4.

The spinner is biased.

The probability that the spinner will land on each of the numbers 2 and 3 is given in the table. The probability that the spinner will land on 1 is equal to the probability that it will land on 4.

Number	1	2	3	4
Probability	x	0.46	0.28	x

Sarah is going to spin the spinner 500 times.

Work out an estimate for the number of times it will land on 4

.....

(Total 4 marks)

8. Dan can put up 30 tiles in one hour.
He always works at the same speed.

He tiles a wall that needs 140 tiles.

He starts work at 7.30 a.m.

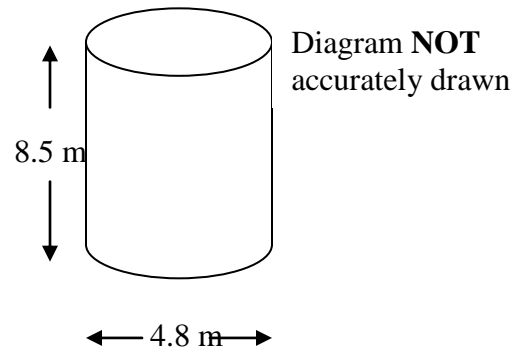
He has a 20 minute break in the morning and 45 minutes for lunch.

Work out the time that Dan should finish tiling the wall

(Total 4 marks)

9. On a farm, wheat grain is stored in a cylindrical tank. The cylindrical tank has an internal diameter of 4.8 m and a height of 8.5 m.

1 m³ of grain weighs 0.766 tonnes.



Calculate the weight, in tonnes, of wheat in the storage tank when it is full.
Give your answer correct to 1 decimal place.

..... tonnes
(Total 3 marks)

10. Simon spent $\frac{1}{4}$ of his wages on rent.

He spent 20% of his wages on food.

He spent 0.15 of his wages on clothes

Work out the fraction of his wages that he had left.

.....
(Total 3 marks)

11. The equation

$$x^3 + 2x = 42$$

has a solution between 3 and 4

Use a trial and improvement method to find this solution.

Give your answer correct to one decimal place.

You must show **ALL** your working.

$x = \dots\dots\dots$
(Total 4 marks)

12. (a) Solve $5x + 12 = 70$

$x = \dots\dots\dots$
(2)

(b) Solve $p + 9 = 2(5 - p)$

$p = \dots\dots\dots$
(3)
(Total 5 marks)

13. The time taken for light to reach Earth from the edge of the known universe is 14 000 000 000 years.

Light travels at the speed of 9.46×10^{12} km/year.

Work out the distance, in kilometres, from the edge of the known universe to Earth.
Give your answer in standard form.

..... km
(Total 3 marks)

14. Simplify fully

(a) $p^2 \times p^7$

.....
(1)

(b) $\frac{3q^4 \times 2q^5}{q^3}$

.....
(2)

(c) $(2xy^3)^5$

.....
(2)
(Total 5 marks)

15. Jenny recorded the heights, in centimetres, of the boys in her class.

She put the heights in order.

138	144	149	152	158	164	165	167
170	170	176	179	183	185	186	

(a) Find

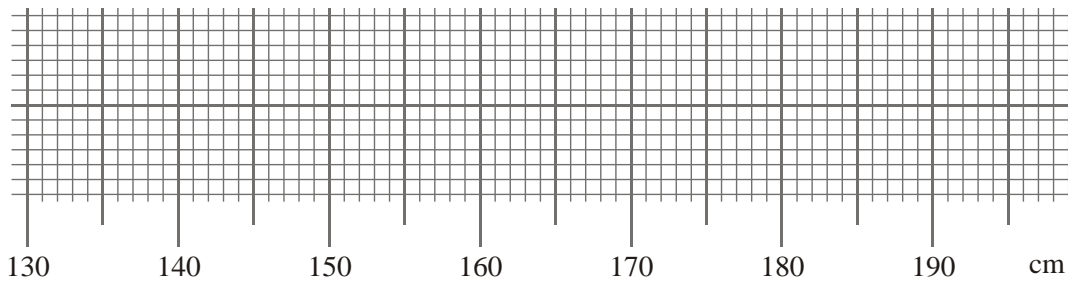
(i) the lower quartile,

..... cm

(ii) the upper quartile.

..... cm
(2)

(b) On the grid, draw a box plot for this data.



(3)
(Total 5 marks)

16.

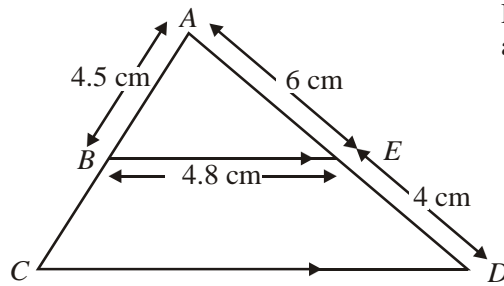


Diagram **NOT**
accurately drawn

BE is parallel to CD .

$AE = 6$ cm, $ED = 4$ cm, $AB = 4.5$ cm, $BE = 4.8$ cm.

(a) Calculate the length of CD .

.....cm
(2)

(b) Calculate the perimeter of the trapezium $EBCD$.

.....cm
(2)
(Total 4 marks)

17.

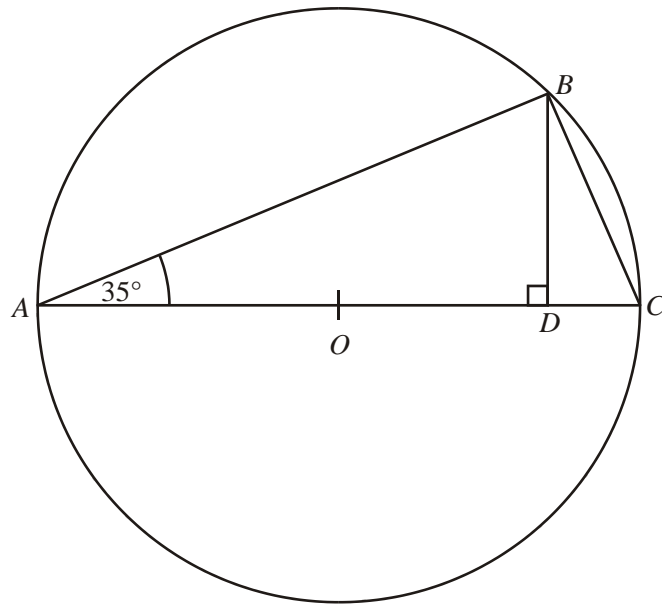


Diagram **NOT** accurately drawn

The diagram shows a circle, centre O .

AC is a diameter.

Angle $BAC = 35^\circ$.

D is the point on AC such that angle BDA is a right angle.

(a) Work out the size of angle BCA .

Give reasons for your answer.

.....^o
(2)

(b) Calculate the size of angle BOA .

.....^o
(2)

(Total 4 marks)

18.

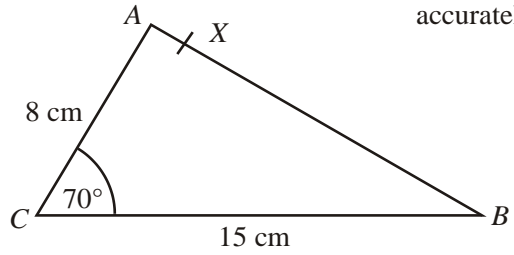


Diagram **NOT**
accurately drawn

In triangle ABC ,
 $AC = 8$ cm,
 $CB = 15$ cm,
Angle $ACB = 70^\circ$.

- (a) Calculate the area of triangle ABC .
Give your answer correct to 3 significant figures.

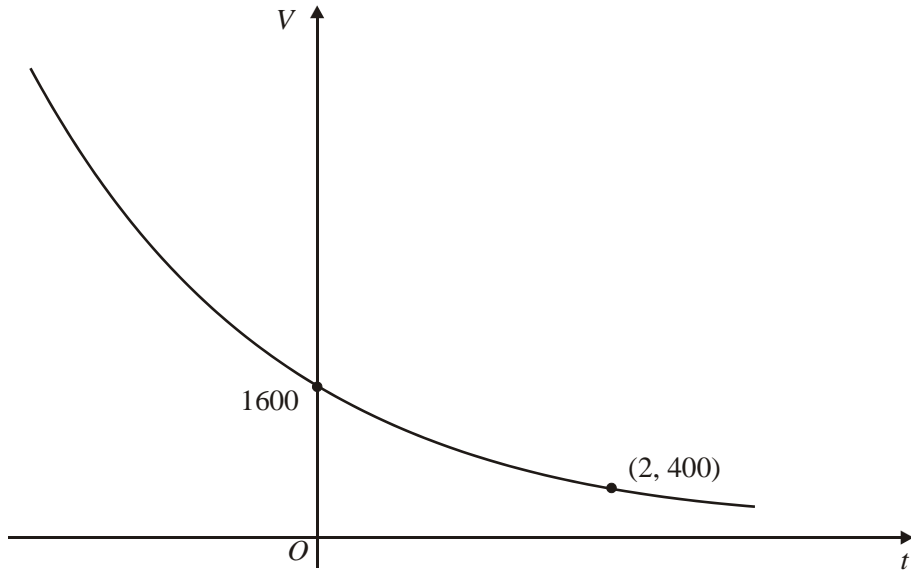
..... cm^2
(2)

X is the point on AB such that angle $CXB = 90^\circ$.

- (b) Calculate the length of CX .
Give your answer correct to 3 significant figures.

..... cm
(4)
(Total 6 marks)

19. Mr Patel has a car.



The value of the car on January 1st 2000 was £1600

The value of the car on January 1st 2002 was £400

The sketch graph shows how the value, £ V , of the car changes with time.

The equation of the sketch graph is

$$V = pq^t$$

where t is the number of years after January 1st 2000.

p and q are positive constants.

(a) Use the information on the graph to find the value of p and the value of q .

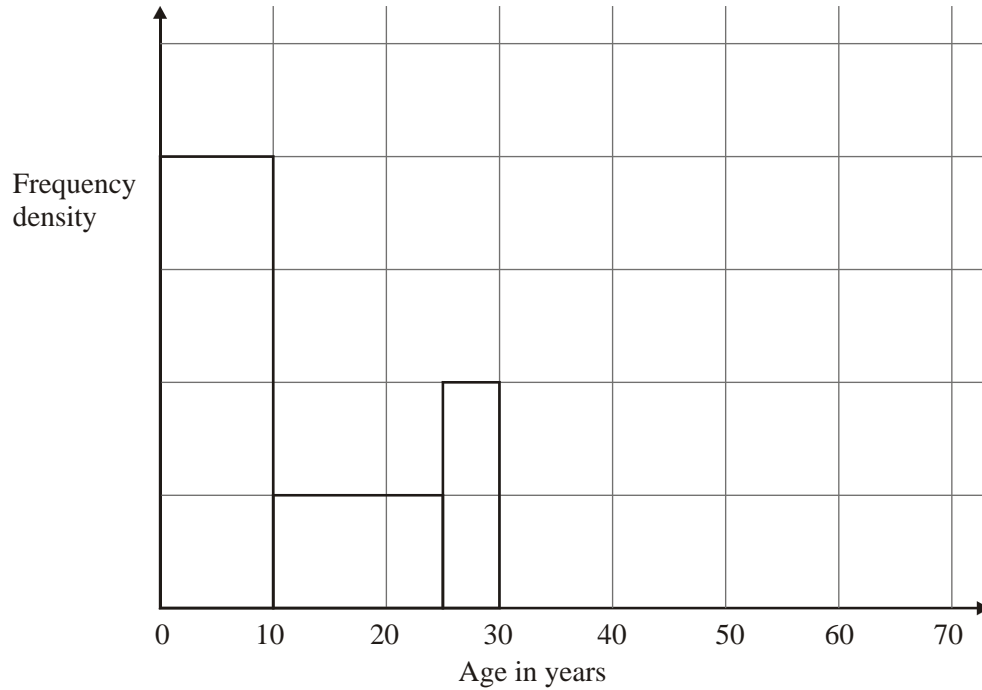
$$p = \dots\dots\dots q = \dots\dots\dots \quad (3)$$

(b) Using your values of p and q in the formula $V = pq^t$ find the value of the car on January 1st 1998.

£ $\dots\dots\dots$ (2)

(Total 5 marks)

20. The incomplete table and histogram give some information about the ages of the people who live in a village.



- (a) Use the information in the histogram to complete the frequency table below.

Age (x) in years	Frequency
$0 < x \leq 10$	160
$10 < x \leq 25$	
$25 < x \leq 30$	
$30 < x \leq 40$	100
$40 < x \leq 70$	120

(2)

- (b) Complete the histogram.

(2)

(Total 4 marks)

- 21.** A bag contains 6 black beads, 10 red beads and 4 green beads.
Helen takes a bead at random from the bag, records its colour and replaces it.
She does this two more times.

Work out the probability that, of the three beads Helen takes, exactly two will be the same colour.

.....
(Total 5 marks)

22. (a) Factorise fully $4m^2 - 12mn$

.....

(2)

(b) Factorise $9x^2 - 6x + 1$

.....

(2)

(c) Solve $x^2 + 4x - 10 = 0$

Give your solutions correct to 2 decimal places.

.....

(3)

(Total 7 marks)

TOTAL FOR PAPER: 100 MARKS

END