

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9-1)

Centre Number

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Candidate Number

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Time 1 hour 30 minutes

**Paper
reference**

1MA1/1H

Mathematics
PAPER 1 (Non-Calculator)
Higher Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, Formulae Sheet (enclosed). 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.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may not be used.**



Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.
- Good luck with your examination.

Turn over ►

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Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Solve $7x - 27 < 8$

.....
(Total for Question 1 is 2 marks)

2 Write 124 as a product of its prime factors.

.....
(Total for Question 2 is 2 marks)

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3 A delivery company has a total of 160 cars and vans.

the number of cars : the number of vans = 3 : 7

Each car and each van uses electricity or diesel or petrol.

$\frac{1}{8}$ of the cars use electricity.

25% of the cars use diesel.

The rest of the cars use petrol.

Work out the number of cars that use petrol.

You must show all your working.

.....
(Total for Question 3 is 5 marks)



4 (a) Write 1.63×10^{-3} as an ordinary number.

.....
(1)

(b) Write 438 000 in standard form.

.....
(1)

(c) Work out $(4 \times 10^3) \times (6 \times 10^{-5})$
Give your answer in standard form.

.....
(2)

(Total for Question 4 is 4 marks)

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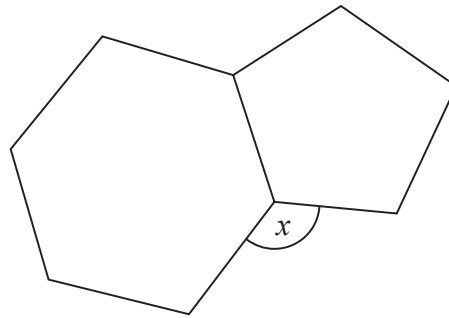


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5 Here is a regular hexagon and a regular pentagon.



Work out the size of the angle marked x .
You must show all your working.

.....
(Total for Question 5 is 3 marks)

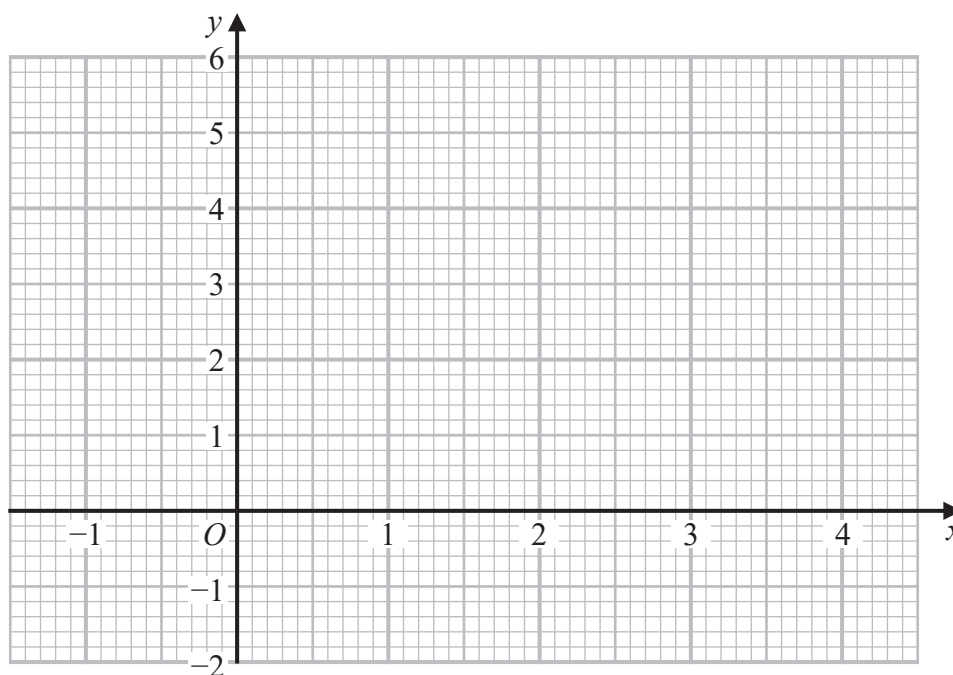


6 (a) Complete the table of values for $y = x^2 - 3x + 1$

x	-1	0	1	2	3	4
y		1	-1			

(2)

(b) On the grid, draw the graph of $y = x^2 - 3x + 1$ for values of x from -1 to 4



(2)

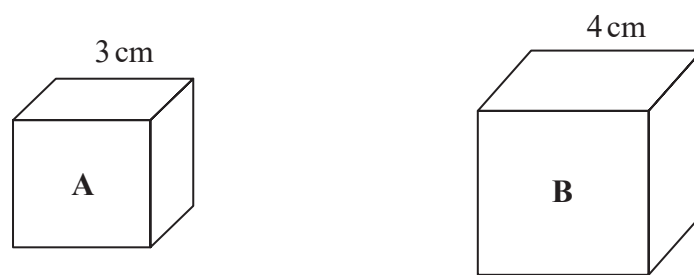
(c) Using your graph, find estimates for the solutions of the equation $x^2 - 3x + 1 = 0$

(2)

(Total for Question 6 is 6 marks)



7 Here are two cubes, **A** and **B**.



Cube **A** has a mass of 81 g.

Cube **B** has a mass of 128 g.

Work out

the density of cube **A** : the density of cube **B**

Give your answer in the form $a : b$, where a and b are integers.

.....
(Total for Question 7 is 3 marks)



- 8 The table shows the amount of snow, in cm, that fell each day for 30 days.

Amount of snow (s cm)	Frequency
$0 \leq s < 10$	8
$10 \leq s < 20$	10
$20 \leq s < 30$	7
$30 \leq s < 40$	2
$40 \leq s < 50$	3

Work out an estimate for the mean amount of snow per day.

..... cm

(Total for Question 8 is 3 marks)

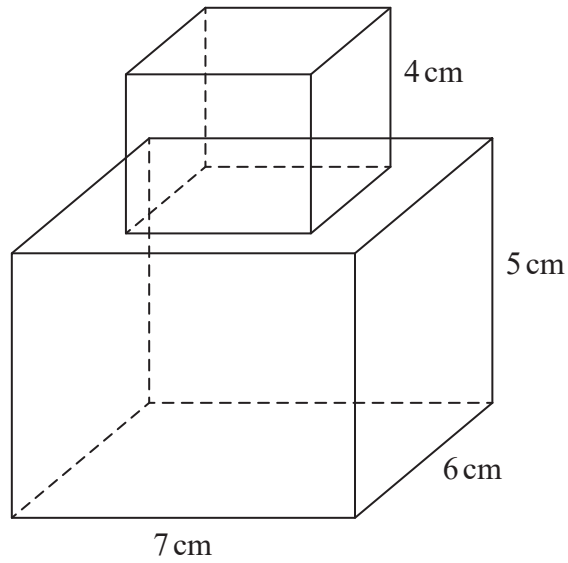


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9 A cube is placed on top of a cuboid, as shown in the diagram, to form a solid.



The cube has edges of length 4 cm.
The cuboid has dimensions 7 cm by 6 cm by 5 cm.

Work out the total surface area of the solid.

..... cm²

(Total for Question 9 is 3 marks)



- 10 The table shows some information about the profit made each day at a cricket club on 100 days.

Profit (£ x)	Frequency
$0 \leq x < 50$	10
$50 \leq x < 100$	15
$100 \leq x < 150$	25
$150 \leq x < 200$	30
$200 \leq x < 250$	5
$250 \leq x < 300$	15

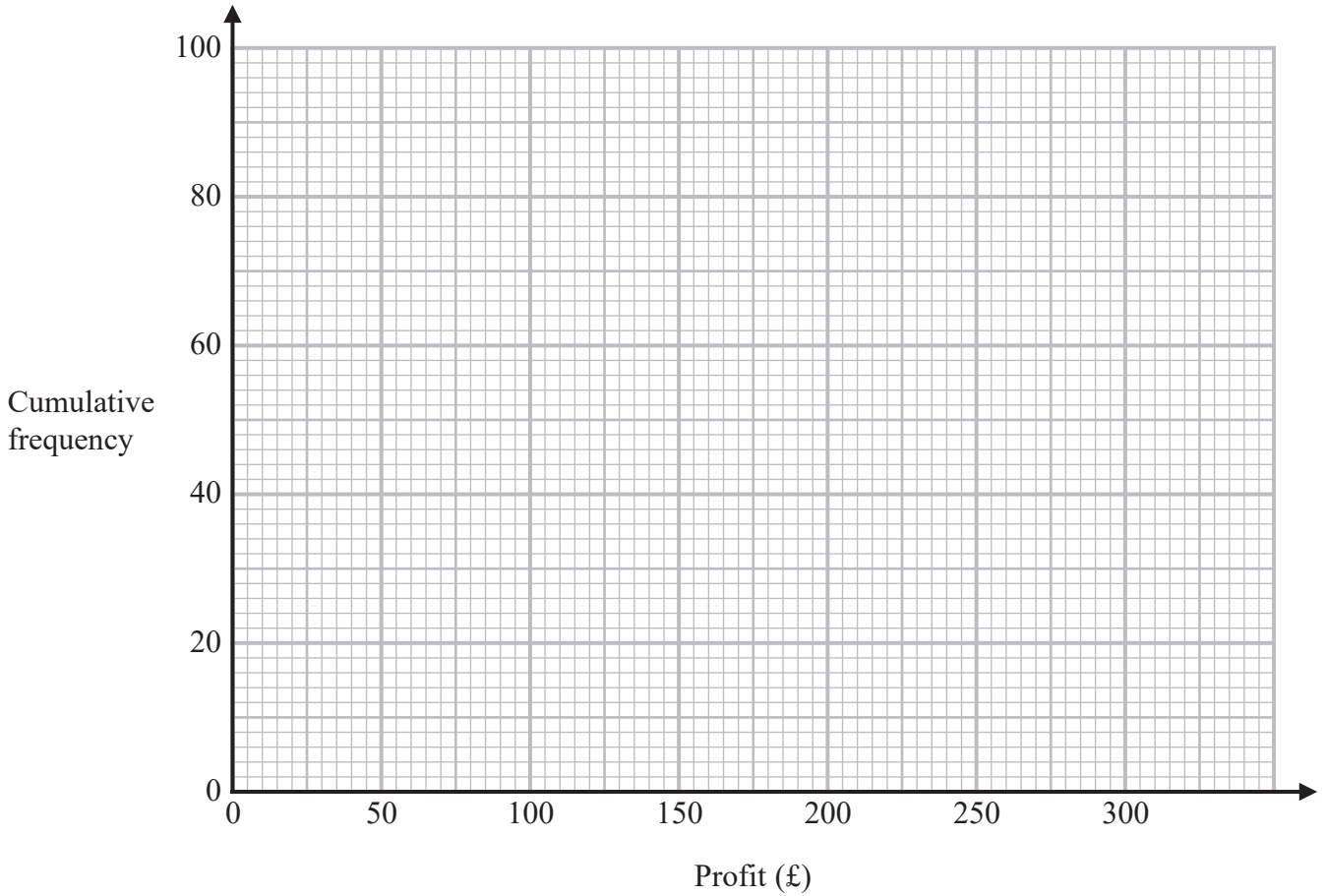
- (a) Complete the cumulative frequency table.

Profit (£ x)	Cumulative frequency
$0 \leq x < 50$	
$0 \leq x < 100$	
$0 \leq x < 150$	
$0 \leq x < 200$	
$0 \leq x < 250$	
$0 \leq x < 300$	

(1)



(b) On the grid, draw a cumulative frequency graph for this information.



(2)

(c) Use your graph to find an estimate for the number of days on which the profit was less than £125

..... days

(1)

(d) Use your graph to find an estimate for the interquartile range.

£.....

(2)

(Total for Question 10 is 6 marks)

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- 11 Cormac has some sweets in a bag.
The sweets are lime flavoured or strawberry flavoured or orange flavoured.

In the bag

$$\begin{array}{l} \text{number of lime} \\ \text{flavoured sweets} \end{array} : \begin{array}{l} \text{number of strawberry} \\ \text{flavoured sweets} \end{array} : \begin{array}{l} \text{number of orange} \\ \text{flavoured sweets} \end{array} = 9 : 4 : x$$

Cormac is going to take at random a sweet from the bag.

The probability that he takes a lime flavoured sweet is $\frac{3}{7}$

Work out the value of x .

$$x = \dots\dots\dots$$

(Total for Question 11 is 3 marks)



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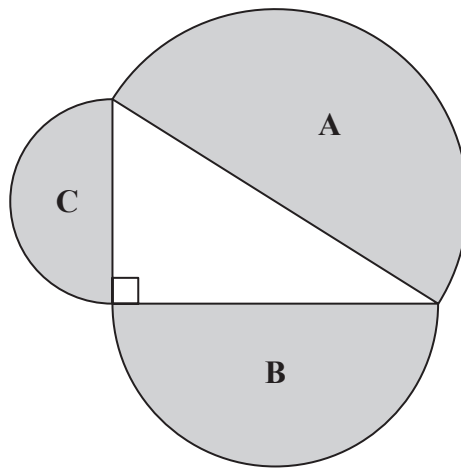
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- 12 Express $0.1\dot{1}\dot{7}$ as a fraction.
You must show all your working.

.....
(Total for Question 12 is 3 marks)



- 13 A right-angled triangle is formed by the diameters of three semicircular regions, **A**, **B** and **C** as shown in the diagram.



Show that

$$\text{area of region A} = \text{area of region B} + \text{area of region C}$$

(Total for Question 13 is 3 marks)

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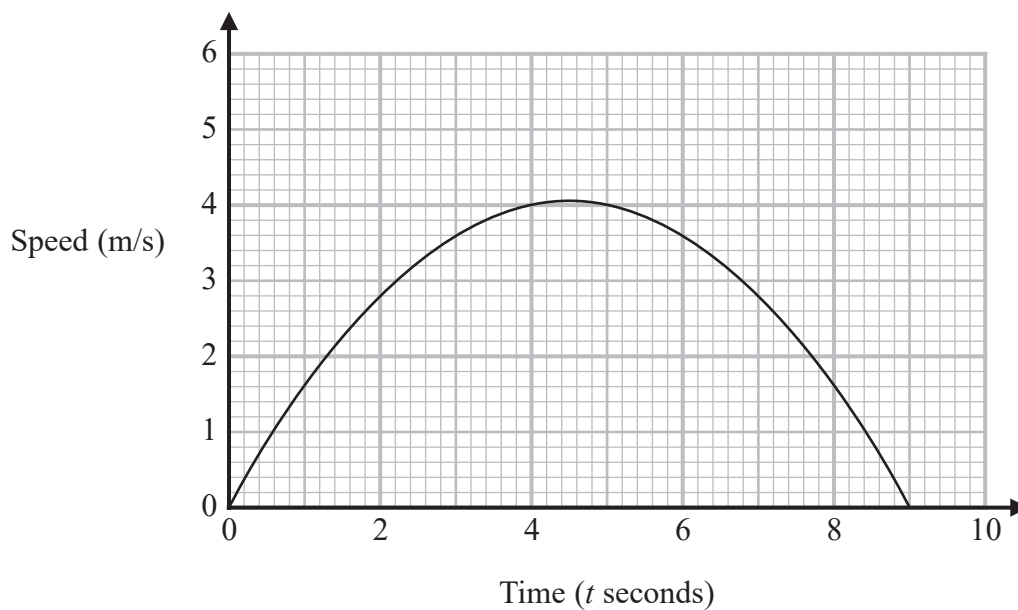


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14 Here is a speed-time graph.



(a) Work out an estimate of the gradient of the graph at $t = 2$

.....
(3)

(b) What does the area under the graph represent?

.....
.....
(1)

(Total for Question 14 is 4 marks)



15 A , B and C are three points such that

$$\vec{AB} = 3\mathbf{a} + 4\mathbf{b}$$

$$\vec{AC} = 15\mathbf{a} + 20\mathbf{b}$$

(a) Prove that A , B and C lie on a straight line.

(2)

D , E and F are three points on a straight line such that

$$\vec{DE} = 3\mathbf{e} + 6\mathbf{f}$$

$$\vec{EF} = -10.5\mathbf{e} - 21\mathbf{f}$$

(b) Find the ratio

length of DF : length of DE

.....
(3)

(Total for Question 15 is 5 marks)



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- 16 A first aid test has two parts, a theory test and a practical test.
The probability of passing the theory test is 0.75
The probability of passing only one of the two parts is 0.36
- The two events are independent.
- Work out the probability of passing the practical test.

.....

(Total for Question 16 is 4 marks)



17 y is directly proportional to the square root of t .
 $y = 15$ when $t = 9$

t is inversely proportional to the cube of x .
 $t = 8$ when $x = 2$

Find a formula for y in terms of x .
Give your answer in its simplest form.

.....
(Total for Question 17 is 4 marks)

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18 Work out the value of $\frac{\left(5\frac{4}{9}\right)^{-\frac{1}{2}} \times \left(4\frac{2}{3}\right)}{2^{-3}}$

You must show all your working.

.....
(Total for Question 18 is 4 marks)



19 Solve $\frac{1}{2x-1} + \frac{3}{x-1} = 1$

Give your answer in the form $\frac{p \pm \sqrt{q}}{2}$ where p and q are integers.

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.....
(Total for Question 19 is 4 marks)



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20 The centre of a circle is the point with coordinates $(-1, 3)$

The point A with coordinates $(6, 8)$ lies on the circle.

Find an equation of the tangent to the circle at A .

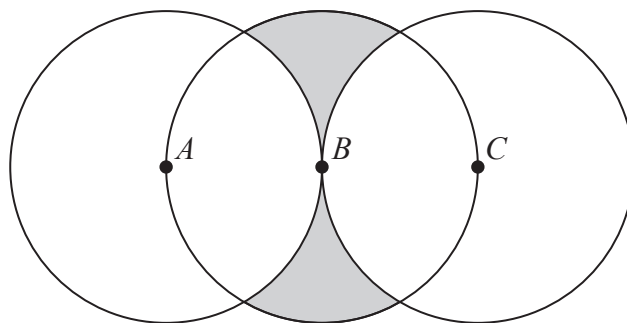
Give your answer in the form $ax + by + c = 0$ where a , b and c are integers.

.....
(Total for Question 20 is 4 marks)



21 The diagram shows three circles, each of radius 4 cm.

The centres of the circles are A , B and C such that ABC is a straight line and $AB = BC = 4$ cm.



Work out the total area of the two shaded regions.
Give your answer in terms of π

..... cm²

(Total for Question 21 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS



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