

Please check the examination details below before entering your candidate information

Candidate surname	Other names
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**Pearson Edexcel
International GCSE**

Centre Number	Candidate Number
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Tuesday 3 November 2020

Morning (Time: 2 hours)	Paper Reference 4MA1/1H
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**Mathematics A
Paper 1H
Higher Tier**



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
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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.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.
Anything you write on the formulae page will gain **NO** credit.

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.*

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ►

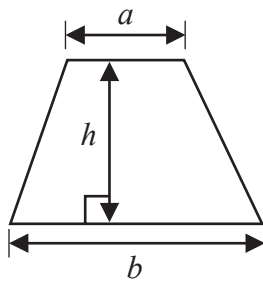
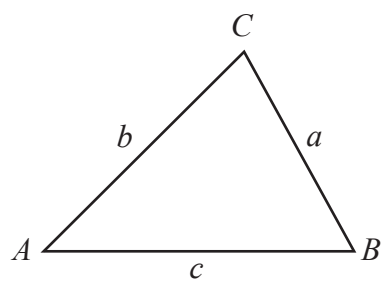
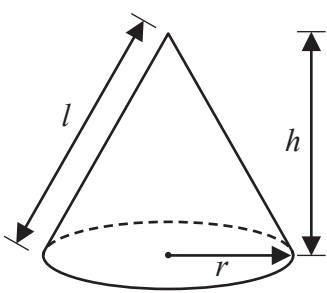
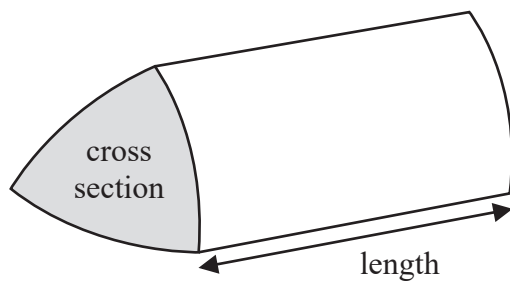
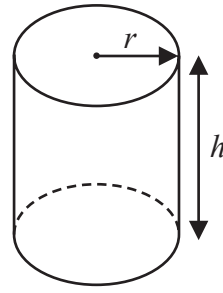
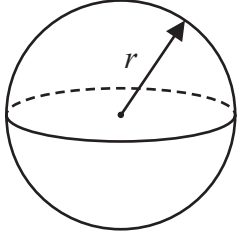
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International GCSE Mathematics

Formulae sheet – Higher Tier

<p>Arithmetic series Sum to n terms, $S_n = \frac{n}{2} [2a + (n - 1)d]$</p>	<p>Area of trapezium = $\frac{1}{2}(a + b)h$</p>
<p>The quadratic equation The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$</p>	
<p>Trigonometry</p> 	<p>In any triangle ABC 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 = $\frac{1}{2} ab \sin C$</p>
<p>Volume of cone = $\frac{1}{3} \pi r^2 h$ Curved surface area of cone = $\pi r l$</p> 	<p>Volume of prism = area of cross section \times length</p> 
<p>Volume of cylinder = $\pi r^2 h$ Curved surface area of cylinder = $2\pi r h$</p> 	<p>Volume of sphere = $\frac{4}{3} \pi r^3$ Surface area of sphere = $4\pi r^2$</p> 

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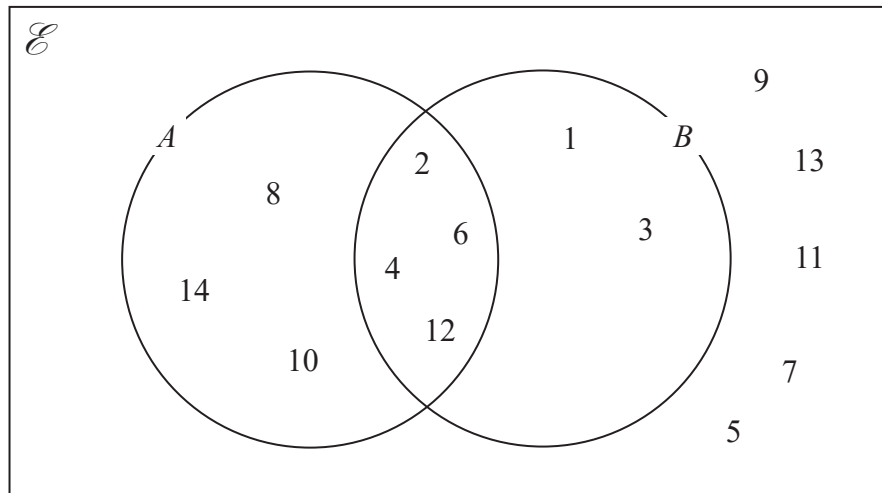
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Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The numbers from 1 to 14 are shown in the Venn diagram.



(a) List the members of the set $A \cap B$

.....
(1)

(b) List the members of the set B'

.....
(1)

A number is picked at random from the numbers in the Venn diagram.

(c) Find the probability that this number is in set A but is **not** in set B .

.....
(2)

(Total for Question 1 is 4 marks)



- 2 Toy cars are made in a factory.
The toy cars are made for 15 hours each day.
5 toy cars are made every 12 seconds.

For the toy cars made each day, the probability of a toy car being faulty is 0.002

Work out an estimate of the number of faulty toy cars that are made each day.

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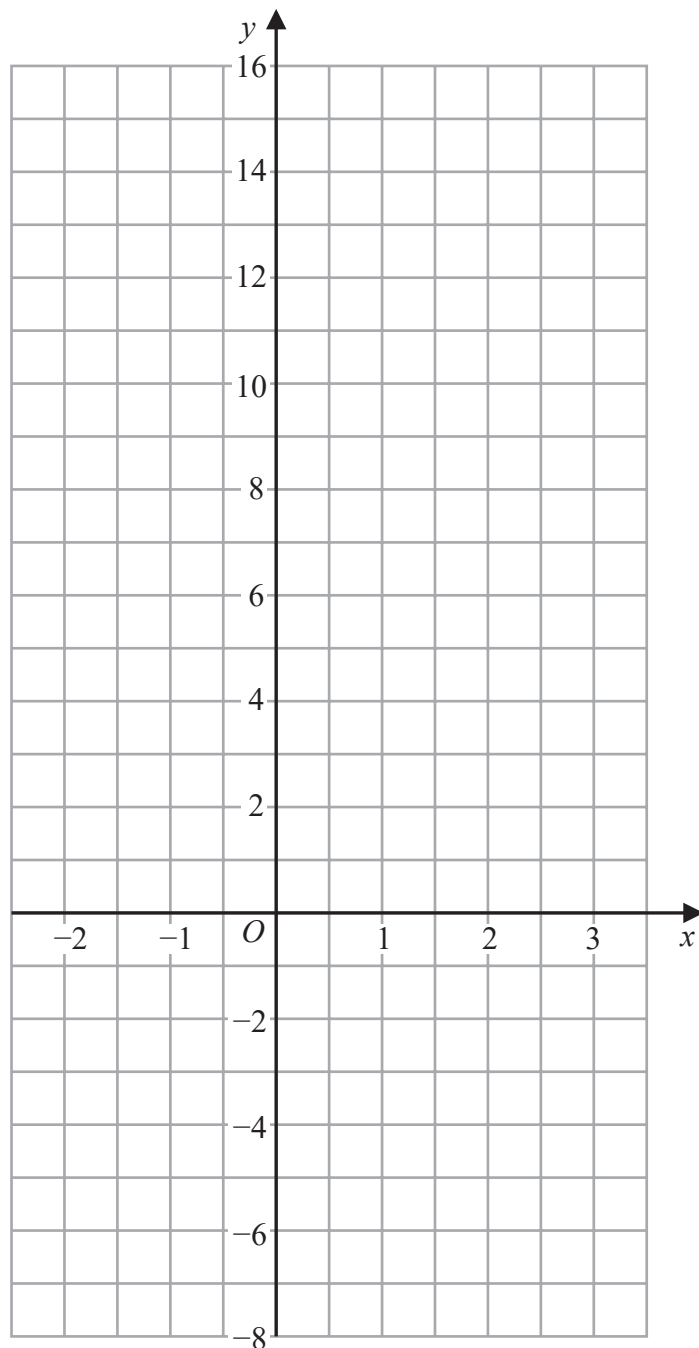
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.....
(Total for Question 2 is 4 marks)



3 On the grid, draw the graph of $y = 7 - 4x$ for values of x from -2 to 3



(Total for Question 3 is 3 marks)

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4 Here is a list of six numbers written in order of size.

4 7 x 10 y y

The numbers have

a median of 9

a mean of 11

Find the value of x and the value of y .

$x =$

$y =$

(Total for Question 4 is 4 marks)

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5 (a) Write 5.7×10^{-3} as an ordinary number.

.....
(1)

(b) Write 800 000 in standard form.

.....
(1)

(c) Work out $\frac{3 \times 10^5 - 2.7 \times 10^4}{6 \times 10^{-2}}$

.....
(2)

(Total for Question 5 is 4 marks)

6 A rocket travelled 100 km at an average speed of 28 440 km/h.

Work out how long it took the rocket to travel the 100 km.
Give your answer in seconds, correct to the nearest second.

..... seconds

(Total for Question 6 is 3 marks)



7 (a) Solve $5(4 - x) = 7 - 3x$
Show clear algebraic working.

$x =$
(3)

(b) Factorise fully $16m^3g^3 + 24m^2g^5$

.....
(2)

(c) (i) Factorise $y^2 - 2y - 48$

.....
(2)

(ii) Hence, solve $y^2 - 2y - 48 = 0$

.....
(1)

(Total for Question 7 is 8 marks)



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8 Here is a 10-sided polygon.

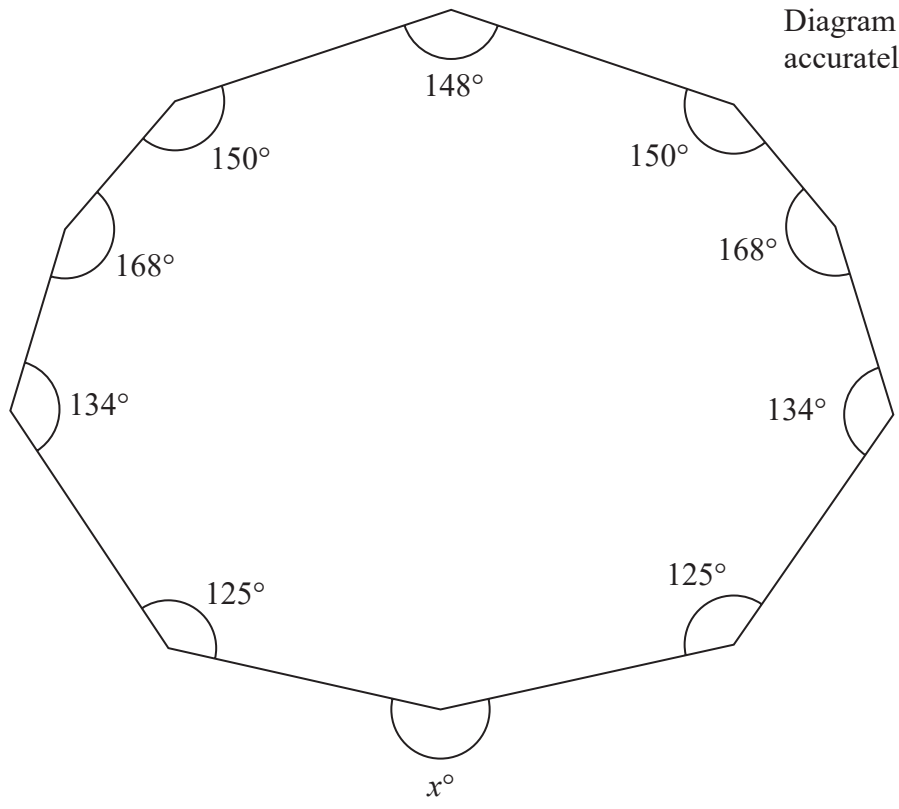


Diagram **NOT** accurately drawn

Work out the value of x .

$x = \dots\dots\dots$

(Total for Question 8 is 4 marks)



9 In a sale, normal prices are reduced by 20%

A bag costs 1080 rupees in the sale.

Work out the normal price of the bag.

..... rupees

(Total for Question 9 is 3 marks)

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10 $A = 2 \times 3^{43}$
 $B = 16 \times 3^{37}$

(a) Find the highest common factor (HCF) of A and B .

.....
(1)

(b) Express the number $A \times B$ as a product of powers of its prime factors.
Give your answer in its simplest form.

.....
(2)

(Total for Question 10 is 3 marks)



11 The diagram shows trapezium $ABCD$ in which BC and AD are parallel.

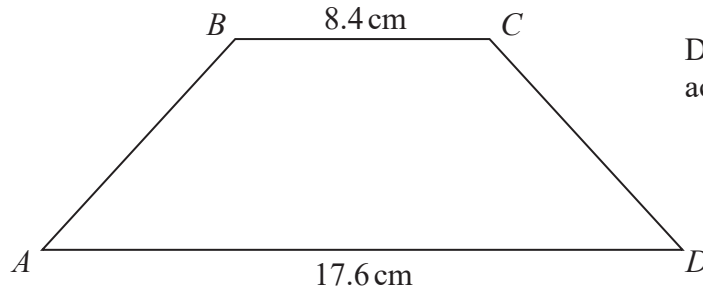


Diagram **NOT** accurately drawn

The trapezium has exactly one line of symmetry.

$$BC = 8.4 \text{ cm}$$
$$AD = 17.6 \text{ cm}$$

The trapezium has area 179.4 cm^2

Work out the size of angle ABC .
Give your answer correct to 1 decimal place.

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(Total for Question 11 is 6 marks)



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12 Solve the simultaneous equations

$$7x - 2y = 34$$

$$3x + 5y = -3$$

Show clear algebraic working.

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

$$y = \dots\dots\dots$$

(Total for Question 12 is 4 marks)



13 Jan invests \$8000 in a savings account.
The account pays compound interest at a rate of $x\%$ per year.
At the end of 6 years, there is a total of \$8877.62 in the account.
Work out the value of x .
Give your answer correct to 2 decimal places.

$x = \dots\dots\dots$

(Total for Question 13 is 3 marks)

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14 F is inversely proportional to the square of v .

Given that $F = 6.5$ when $v = 4$

find a formula for F in terms of v .

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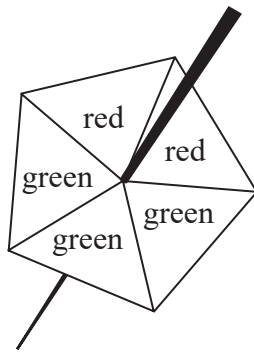
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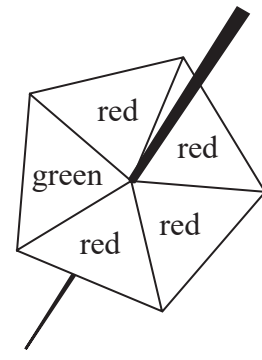
.....
(Total for Question 14 is 3 marks)



15 Harry has two fair 5-sided spinners.



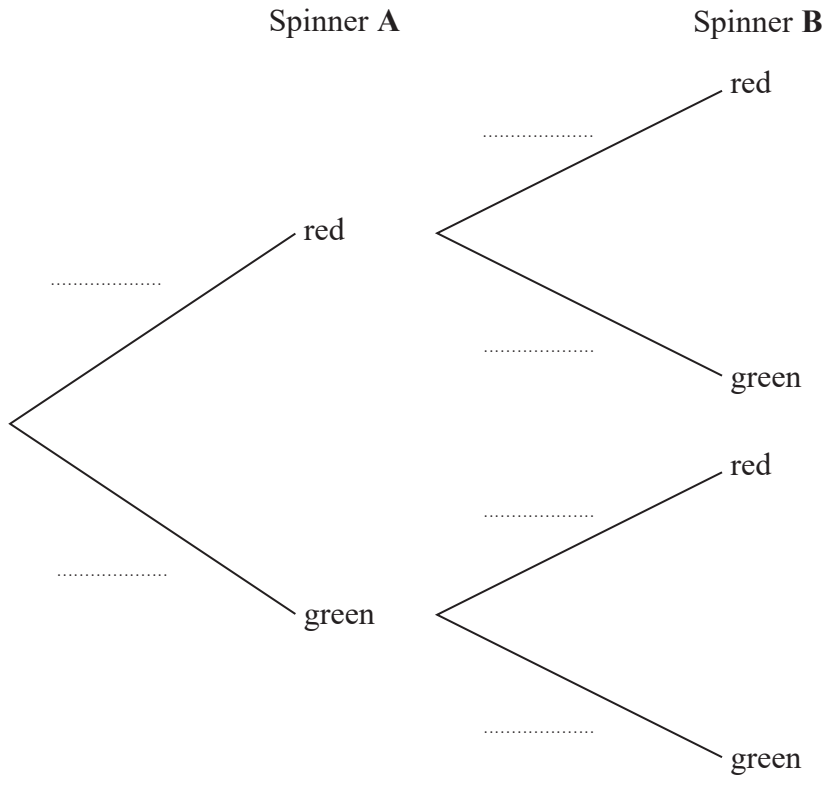
Spinner A



Spinner B

Harry is going to spin each spinner once.

(a) Complete the probability tree diagram.



(2)

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(b) Work out the probability that at least one of the spinners will land on green.

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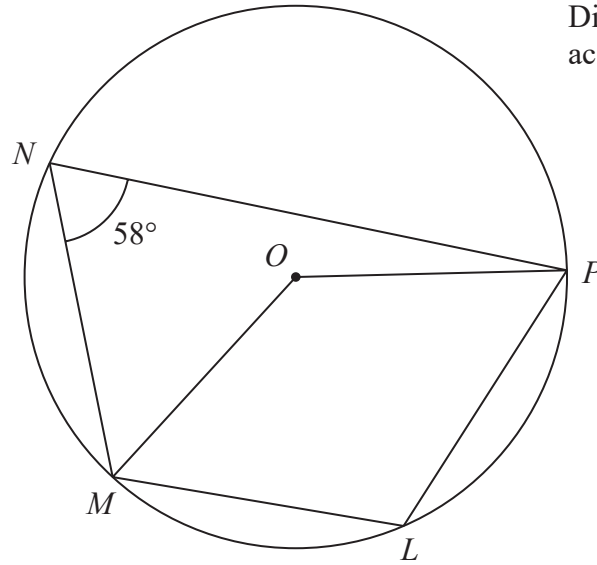
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.....
(3)

(Total for Question 15 is 5 marks)



Diagram **NOT** accurately drawn



L, M, N and P are points on a circle, centre O

Angle $MNP = 58^\circ$

(a) (i) Find the size of angle MLP

.....
°

(ii) Give a reason for your answer.

.....
.....

(2)

(b) Find the size of the reflex angle MOP

.....
°

(2)

(Total for Question 16 is 4 marks)

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17 A metal block has a mass of 5 kg, correct to the nearest 50 grams.
The block has a volume of $(1.84 \times 10^{-3}) \text{ m}^3$, correct to 3 significant figures.

Work out the upper bound for the density of the block.
Give your answer in kg/m^3 correct to 1 decimal place.
Show your working clearly.

..... kg/m^3

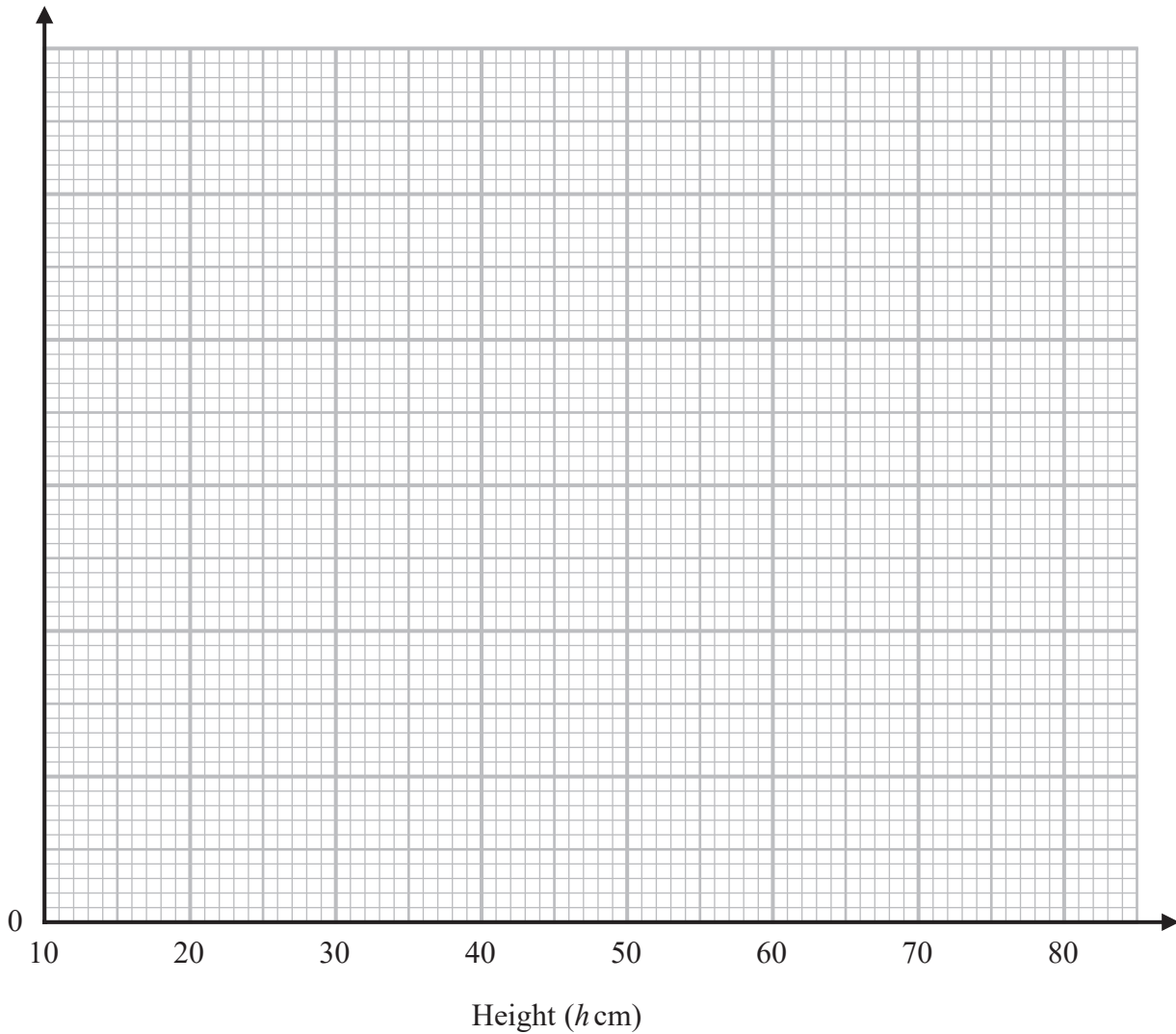
(Total for Question 17 is 4 marks)



18 The table gives information about the heights, in centimetres, of some plants.

Height (h cm)	Frequency
$10 < h \leq 20$	35
$20 < h \leq 35$	45
$35 < h \leq 50$	75
$50 < h \leq 70$	40
$70 < h \leq 80$	8

(a) On the grid, draw a histogram for this information.



(3)

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(b) Work out an estimate for the number of these plants with a height greater than 40 cm.

.....
(2)

(Total for Question 18 is 5 marks)

19 Without using a calculator, rationalise the denominator of $\frac{6}{3 - \sqrt{7}}$

Simplify your answer.
You must show each stage of your working.

.....
(Total for Question 19 is 3 marks)

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20 **R** and **S** are two similar solid shapes.

Shape **R** has surface area 108 cm^2 and volume 135 cm^3

Shape **S** has surface area 300 cm^2

Work out the volume of shape **S**.

..... cm^3

(Total for Question 20 is 3 marks)

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21 Express

$$\frac{1}{3x-2} \times \frac{9x^2-4}{3x^2-13x-10} - \frac{7}{x-1}$$

as a single fraction in its simplest form.

.....
(Total for Question 21 is 5 marks)



22 $ABCD$ is a rhombus.

The diagonals, AC and BD , intersect at the point M .

The coordinates of M are $(6, -11)$

The points A and C both lie on the line with equation $2y + 7x = 20$

Find the exact coordinates of the point where the line through B and D intersects the y -axis.

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(.....,))

(Total for Question 22 is 4 marks)



23 Curve C has equation $y = px^3 - mx$ where p and m are positive integers.

Find the range of values of x , in terms of p and m , for which the gradient of C is negative.

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.....
(Total for Question 23 is 4 marks)



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

8 15 22 29 36

Work out the sum of all the terms from the 50th term to the 100th term inclusive.

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(Total for Question 24 is 4 marks)



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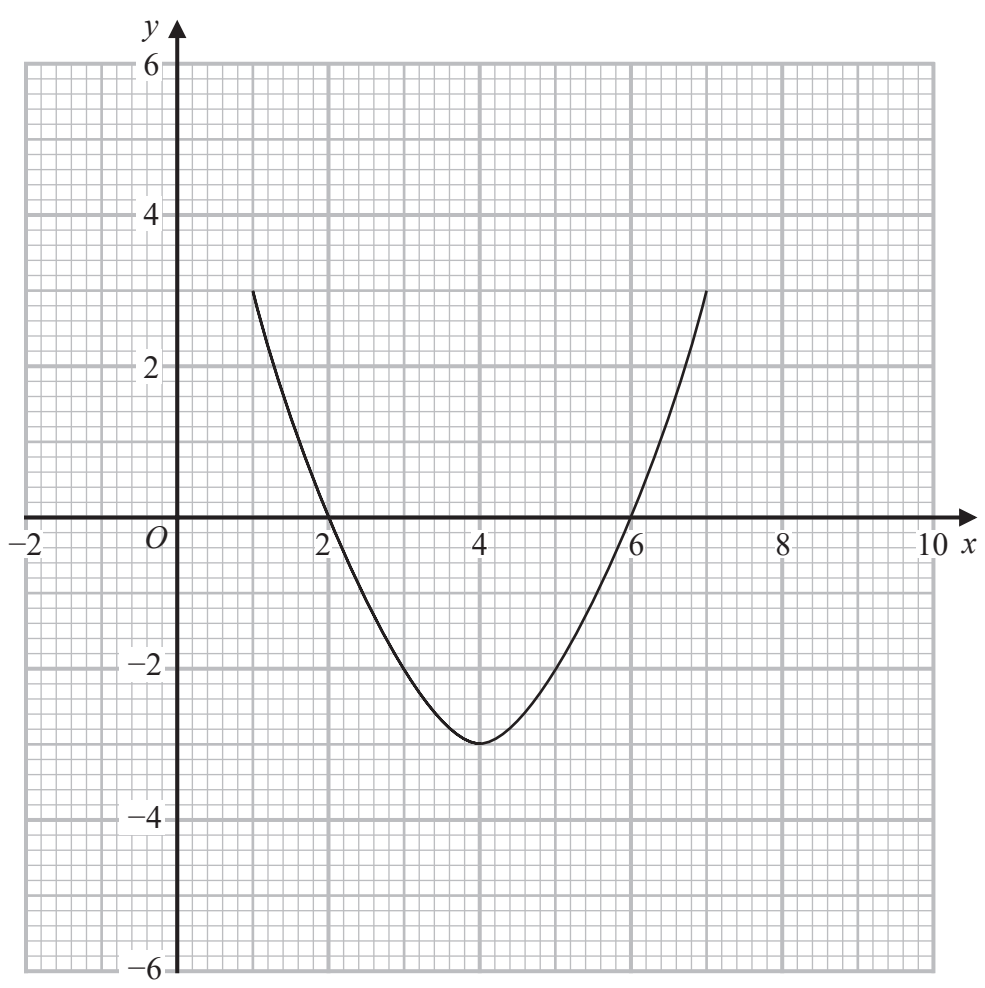
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25 The curve with equation $y = g(x)$ is transformed to the curve with equation $y = -g(x)$ by the single transformation **T**.

(a) Describe fully the transformation **T**.

(1)

The diagram shows the graph of $y = f(x)$



(b) On the grid, draw the graph of $y = 2f(x - 1)$

(2)

(Total for Question 25 is 3 marks)

TOTAL FOR PAPER IS 100 MARKS



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