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MATHEMATICS

- IGCSE Mathematics (O/L)
- IGCSE Further Pure Math (O/L)
- IAL Mathematic (AS & A2)
  Pure, Mechanics & Statistics
- IAL Further Mathematics (AS & A2)

PHYSICS

- IGCSE Physics (O/L)
- IAL Physics (AS & A2)
- SPEED REVISION
- PAPER DISCUSSION

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REVISION
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Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International GCSE

PREDICTED PYTHON BASES/ MAY 2025

Morning (Time: 2 hours)

Paper reference **4MA1/1H**

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

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.

International GCSE Mathematics

Formulae sheet – Higher Tier

Arithmetic series

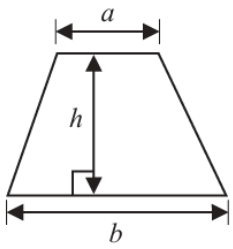
Sum to n terms, $S_n = \frac{n}{2}[2a + (n-1)d]$

The quadratic equation

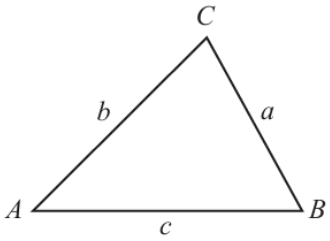
The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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



Trigonometry



In any triangle ***ABC***

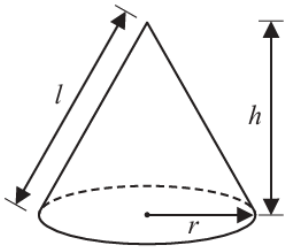
Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

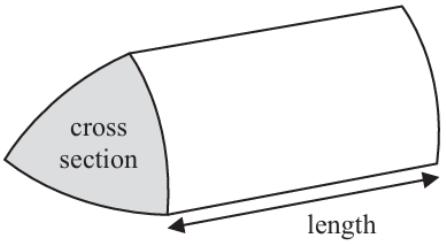
Area of triangle $= \frac{1}{2}ab\sin C$

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

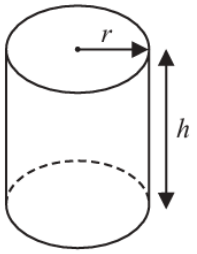
Curved surface area of cone $= \pi rl$



Volume of prism
= area of cross section × length

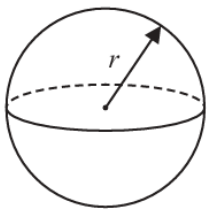


Volume of cylinder $= \pi r^2 h$
Curved surface area of cylinder $= 2\pi rh$



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

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



1. Here are the first four terms of an arithmetic sequence,

$$7 \quad 4 \quad 1 \quad -2$$

a) Find an expression, in terms of n, for the nth term of this sequence.

.....

(2)

The nth term of a different arithmetic sequence is $11 - 2n$

b) Determine the position of the term 19 in the given sequence.

.....

(1)

(Total for Question 1 is 3 marks)

2. A group of students were surveyed about their favorite subjects among Mathematics, Physics, Chemistry, Biology, and Information Technology (IT). Each student selected only one subject as their favorite. One student is then chosen at random from this group. The table below represents the probabilities of a student selecting each subject. It is known that the probability of a student preferring Mathematics is twice the probability of preferring Biology, and three times the probability of preferring Information Technology. The probability of preferring Physics is equal to the probability of preferring Mathematics. Using this information, complete the table of probabilities.

Favorite Subject	Mathematics	Physics	Chemistry	Biology	IT
Probability			0.15		

Given that the number of students who liked IT is only 20. Then find number of students who like Physics or Biology.

.....

(Total for Question 2 is 4 marks)

3. If the (HCF) of x and 360 is 24. $x\ is$ such that, $x = 2^3 \times 3^k$. If x and k are positive integers, find the number x. Show your working clearly.

.....

(Total for Question 3 is 2 marks)

4. Sapumal recorded all his freelancing projects income monthly. Income in April is $\$750$ and it is 25% less than the income in march. Find the total freelancing project income in both March and April.

..... dollars.

(Total for Question 4 is 3 marks)

5. In the diagram $ABDEFG$ is a regular hexogen. Given that $BC = CD$ and $\measuredangle BCD$ 60^0. Work out the size of the angle CDE.

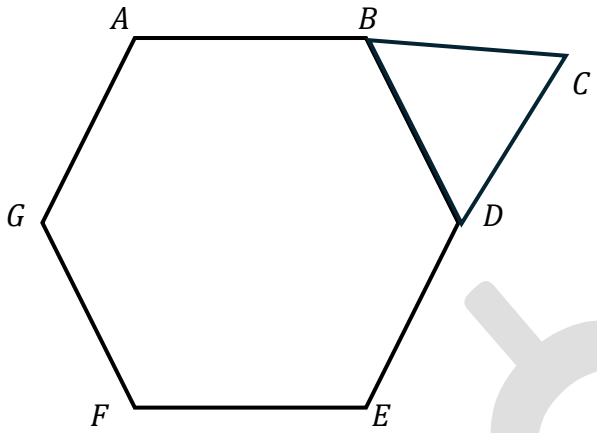


Diagram **NOT** accurately drawn

..... °

(Total for Question 5 is 4 marks)

6.

a) Expand and simplify $(2k - 1)(3k + 2)$

.....

(2)

b) Solve $\frac{2n-1}{3} = 3n - 5$

Show clear algebraic working

$k =$.....

(Total for Question 6 is 5 marks)

7. $\varepsilon = \{x: 0 < x < 10, x \epsilon \mathbb{Z}^+\}$

$$A = \{Prime\ numbers\}$$
$$B = \{Odd\ numbers\}$$

a) Assign all the given details into a Venn diagram.

(2)

b) List the members of the set

i. $A \cap B'$

.....

(1)

ii. $A' \cup B'$

.....

(1)

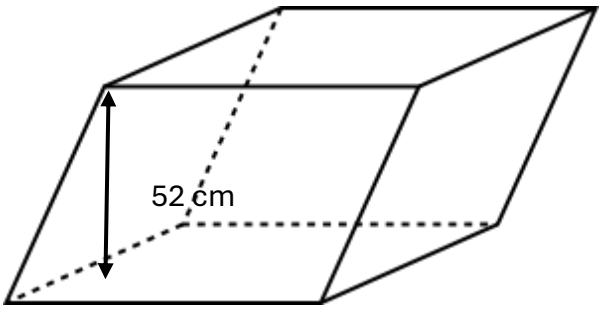
c) Show that $n(A \cap B)' = n(A' \cup B')$. give reasons for your answer.

.....

(1)

(Total for Question 7 is 5 marks)

8. A square based parallelepiped is placed on a table



Volume of the parallelepiped is $83200cm^2$.
The force exerted by the parallelepiped is 64Newtons

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Work out the pressure on the table due to the parallelepiped.

..... newtons/cm2

(Total for Question 8 is 3 marks)

9. The table gives the amount of tea manufactured by China, Kenya, and Sri Lanka in 2024.

Country Name	Production (in Tons)
China	2.4×10^6
Kenya	3.05×10^5
Sri Lanka	3×10^5

i. Write the amount of production in China as an ordinary number.

.....

(1)

ii. How many times greater is China's tea production compared to the total production of Kenya and Sri Lanka? Give your answer correct to 2 significant figures.

..... tonnes

(2)

(Total for Question 9 is 3 marks)

10.

a) Simplify $(k + s + p)^0 + s^0$ where $k, s, and\ p > 0$ and finite

.....

(1)

b) $s^{2k} \times s^{k-1} = s^5$

Find the value of k.

$k =$.....

(1)

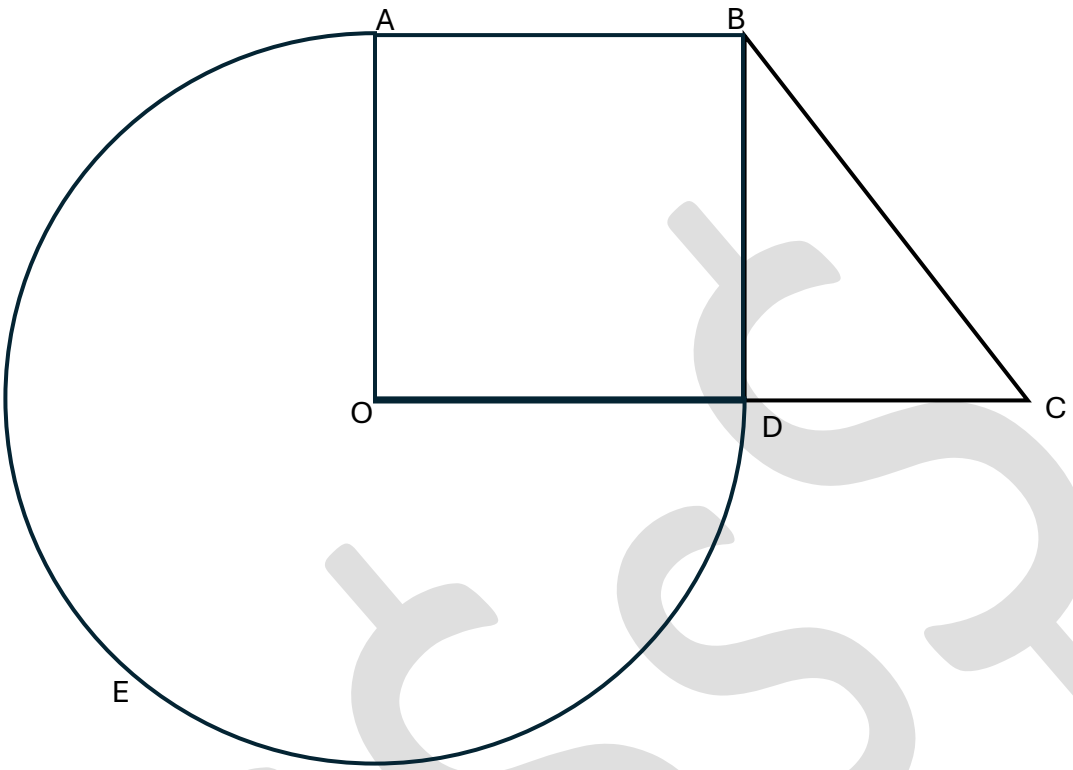
c) Simplify fully. $(5k^{-2}s^{-1}p)^2$

.....

(2)

(Total for Question 10 is 4 marks)

11. The diagram shows a top view of the flat rooftop of a hotel. The hotel owner is planning to install solar panels to cover the entire rooftop. The cost of installing solar panels is $230 per square meter. Estimate the total cost of installing the solar panels. Give your answer to a suitable degree of accuracy and show all your working.



Given that ABCD is a square, AEDO is three quarts of a circle with the radius of 8m, and BDC is a right-angle triangle where BC=10m.

..... dollars

(Total for Question 11 is 4 marks)

12.

a) Factorise fully, $5s^2 - 8s - 4$

.....

(2)

b) Express $\frac{x-1}{x} - \frac{x}{x+1}$ as a single fraction in its simplest form.

.....

(3)

(Total for Question 12 is 5 marks)

13. Nesu has three Toyota cars and five Nissan cars at his premises.
On a particular day, he selects one car at random to use for a function.
After the first function, he selects another car at random from the remaining cars for a second function.
He does not return the first car to the premises after using it.

(a) Draw a probability tree diagram to represent this situation.

(2)

(b) Find the probability that
(i) both cars selected are Toyotas
(ii) one car is a Toyota and the other is a Nissan.

.....

(3)

(Total for Question 13 is 5 marks)

14. Lila and Hari together picked 176 barnacles. Hari picked 20% more barnacles than Lila.
Bidju picked ¾ of the number of barnacles that Lila picked.
How many barnacles did Bidju pick?
Show all your working.

.....

(Total for Question 14 is 5 marks)

15. The function f is defined as

$$f: x \to \frac{x-3}{x+3}$$

a) State the value of x that can not be included in any domain of the function f.

.....

(1)

b) Find the inverse function f^{-1}

$f^{-1}(x)$ = ...

(3)

(Total for Question 15 is 4 marks)

16. There are 20 books on a shelf. 12 of the books are fiction and 8 of the books are non-fiction. Sapu picks 3 books at random from the shelf, without replacement. Work out the probability that Sapu picks at least one book of each type. Show all your working.

.....

(Total for Question 16 is 4 marks)

17. Show that $\frac{1+\sqrt{5}}{\sqrt{5}-2}$ can be written in the form $a + b\sqrt{c}$ where $a, b, and\ c$ are integers to be determined. Show each stage of your working clearly.

(Total for Question 17 is 3 marks)

18. A curve C has equation $y = 4x^5 - 3x^4 - 2x^2 - 3x + 3$

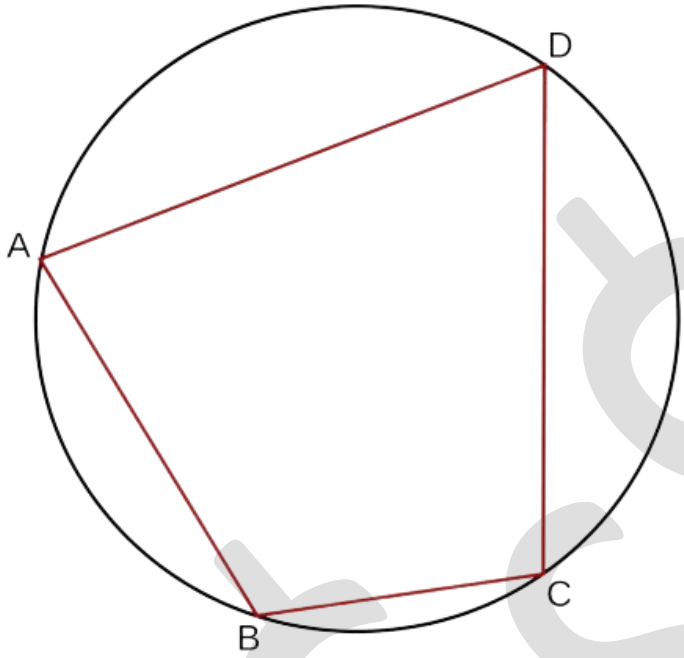
Find the equation of the normal to the curve at $x = 1$

(Total for Question 18 is 5 marks)

19. Here is a cyclic quadrilateral ABCD.

Given that angle BAD is 60^0, $BC = 3cm$, $CD = 5cm$.

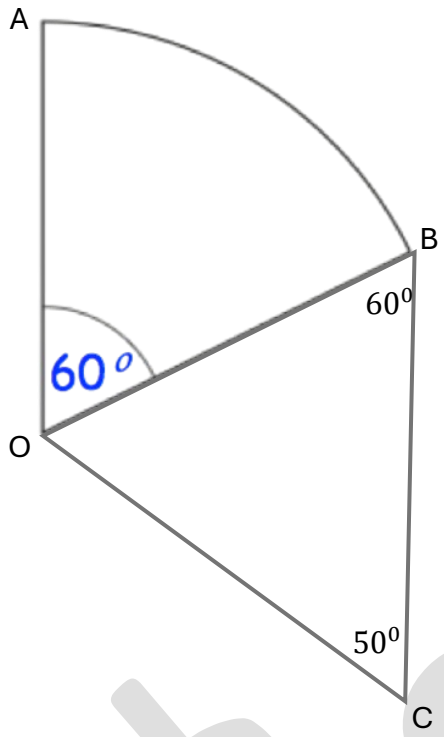
Work out the value of BD, give your answer correct to three significant figures.



BD = ...cm

(Total for Question 19 is 5 marks)

20. The diagram shows a compound figure. OAB is a sector and OC=12.5cm



Work out the area of the compound figure. Give your answer correct to 2 decimal places.

..... cm^2

(Total for Question 20 is 4 marks)

21. The curve has equation $y = g(x)$

There is a maximum point on this curve.

The coordinates of this maximum point are $(-1,4)$

Write down the coordinates of the maximum point on the curve with equation

i. $y = g(x - 1)$

(..... , ...)

(1)

ii. $y = 3g(x + 1) - 2$

(..... , ...)

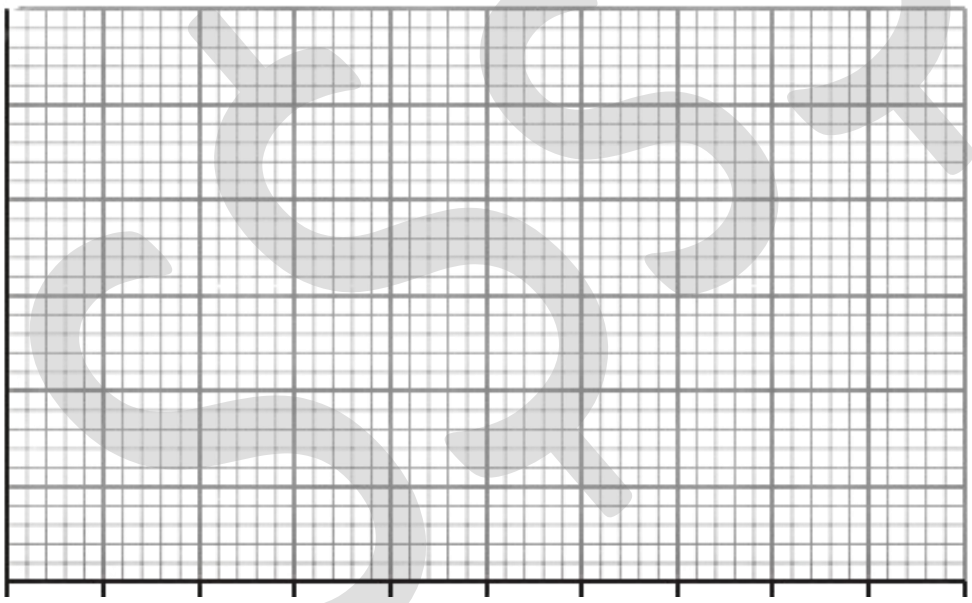
(1)

(Total for Question 21 is 2 marks)

22. Lengths of some socket absobers are given in cm in the table below.

Length (cm)	Frequency
$10 < L \leq 20$	4
$20 < L \leq 30$	6
$30 < L \leq 40$	15
$40 < L \leq 60$	10
$60 < L \leq 80$	5

a) On the grid provided, draw a **frequency density graph** for the data.



(Total for Question 22 is 3 marks)

23. The structure of a pencil case is shown below. It's made of coaxial hemisphere, cylinder, and a right circular based cone. The height of the cylinder is thrice the radius of the hemisphere and the height of the cone is 25% more than the radius of the hemisphere.

The diagram **NOT** accurately drawn

If the volume of the pencil case is $\frac{98}{3}\pi\ cm^3$, find the radius of the cone.

.... cm

(Total for Question 23 is 5 marks)

24. At the annual Chicken Parade, the number of chickens walking past increases by 2 every minute. In the first minute, 3 chickens pass by. The parade continues until 25 chickens pass in one minute.

(a) Find the total number of minutes the parade lasts.

.....

(3)

(b) Calculate the total number of chickens in the parade.

.....

(3)

(Total for Question 24 is 6 marks)

25. $f(x) = 3 - 4x - 2x^2$

Write $f(x)$ in the form $a - b(x - c)^2$

$f(x)$ = ...

(Total for Question 25 is 4 marks

TOTAL FOR PAPER IS 100 MARK