## **PREDICTION PAPER - MAY/JUNE 2025** Cambridge IGCSE<sup>TM</sup>

CANDIDATE NAME	PREP	ARED BY N	IR.PABITRA
CENTRE NUMBER			CANDIDATE NUMBER
MATHEMATIC Paper 4 Calcula	CS ator (Extended) ma	Email us : athtonicsolutions@g	0580 2025 2025 2 hours
You will need: INSTRUCTION Answer all Use a black Write your Write your Do not use Do not writ You should You may us Give non-e degrees, un For π, use of	Geometrical instru <b>IS</b> questions. k or dark blue pen. name, centre numb answer to each que an erasable pen o te on any bar codes I use a scientific cal se tracing paper. show all necessary exact numerical ans nless a different lev either your calculat	You may use an HB pencil for any ber and candidate number in the b estion in the space provided. or correction fluid. S. Iculator where appropriate. working clearly. wers correct to 3 significant figure vel of accuracy is specified in the co or value or 3.142.	y diagrams or graphs. boxes at the top of the page.

#### INFORMATION

- The total mark for this paper is 100.
- The number of marks for each question or part question is shown in brackets [].

#### List of formulas

Area, $A$ , of triangle, base $b$ , height $h$ .	$A = \frac{1}{2}bh$
Area, $A$ , of circle of radius $r$ .	$A = \pi r^2$
Circumference, $C$ , of circle of radius $r$ .	$C = 2\pi r$
Curved surface area, $A$ , of cylinder of radius $r$ , height $h$ .	$A = 2\pi rh$
Curved surface area, $A$ , of cone of radius $r$ , sloping edge $l$ .	$A = \pi r l$
Surface area, $A$ , of sphere of radius $r$ .	$A = 4\pi r^2$
Volume, $V$ , of prism, cross-sectional area $A$ , length $l$ .	V = Al
Volume, V, of pyramid, base area A, height h.	$V = \frac{1}{3}Ah$
Volume, $V$ , of cylinder of radius $r$ , height $h$ .	$V = \pi r^2 h$
Volume, $V$ , of cone of radius $r$ , height $h$ .	$V = \frac{1}{3}\pi r^2 h$
Volume, $V$ , of sphere of radius $r$ .	$V = \frac{4}{3}\pi r^3$
For the equation $ax^2 + bx + c = 0$ , where $a \neq 0$ ,	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
For the triangle shown,	

B A b c c b c c c



1.

Tara goes on a journey by train. The train leaves at 0648. The journey takes 12 hours and 35 minutes.

Find the time when Tara arrives.

2.

Safia has a piece of fabric of length 5.6 m. She cuts the fabric into two parts, with lengths in the ratio 3 : 4.

MATH TON

Calculate the length of the longer part.

3.

*y* is inversely proportional to  $\sqrt{x+2}$ . When x = 2, y = 3.

Find y in terms of x.

*y* = ......[2]

4.



The diagram shows fair dice. Dice B is numbered 2, 3, 3, 4, 4, 4. Dice B is rolled *n* times.

The probability that on the *n*th roll it first lands on a number 3 is  $\frac{32}{729}$ . Find the value of *n*.



5. 
$$g(x) = 2x - 3$$
  $h(x) = 4^{2x-1}$ 

(a) g(2x) = 7

Find the value of x.

(b) Find  $h^{-1}(16)$ .

(c)

f(x) = (3x+1)(x+5)(x-4)

This can be written in the form  $f(x) = ax^3 + bx^2 + cx + d$ .



 $a = \dots, b = \dots, c = \dots, d = \dots$  [3]

The speed-time graph shows information about a car journey.



(a) Find the deceleration of the car between 240 and 320 seconds.



- 3 wear glasses and walk to school
- 2 do not wear glasses and do not walk to school.

Complete the Venn diagram.

7.



[2]

For each of 10 people working in an office, the scatter diagram shows their salary and the value of their car.



(a) One of these people has a salary of \$28000.

```
Find the value of their car.
```

φ [1]	\$	[1]
-------	----	-----

.....

[1]

[1]

(b) Another person starts to work in the office. Their salary is \$54 000 and the value of their car is \$6100.
Plot this information on the scatter diagram.
(c) What type of correlation is shown in the scatter diagram?



Find the value of *r*.

- (a) The value of Priya's car decreases by 10% every year. The value today is \$7695.
  - (i) Calculate the value of the car after one year.
- (ii) Calculate the value of the car one year ago.

\$ ......[3]

(b) Ali invests \$600 at a rate of 2% per year simple interest.

Calculate the value of Ali's investment at the end of 5 years.

(c) Sara invests \$500 at a rate of r% per year compound interest. At the end of 12 years, the value of Sara's investment is \$601.35, correct to the nearest cent.

Simplify.

$$\frac{ax-2a-x+2}{a^2-1}$$



A train travels between two stations.

The distance between the stations is 220 km, correct to the nearest kilometre. The speed of the train is 125 km/h, correct to the nearest 5 km/h.

**MATH TONIC** 

Calculate the upper bound for the time the journey takes. Give your answer in hours and minutes.

..... h ..... min [4]

(a) The scale drawing shows two sides, *AB* and *BC*, of a field. The scale is 5 centimetres represents 200 metres.



 $[Density = Mass \div Volume]$ 

..... m [5]



NOT TO SCALE

The diagram shows a parallelogram OPQT. The position vector of P is **a** and the position vector of T is **b**.

*K* is on *PQ* so that *PK* : KQ = 3 : 1. The lines *OK* and *TQ* are extended to meet at *X*.

Find the position vector of X in terms of **a** and **b**. Give your answer in its simplest form.

 [3]

 MATHONIC

16.

**(a)** 

Sequence	1st term	2nd term	3rd term	4th term	5th term	<i>n</i> th term
А	-7	-3	1	5		
В	7	13	23	37		
С	$\frac{2}{27}$	$\frac{3}{81}$	$\frac{4}{243}$	$\frac{5}{729}$		

Complete the table for the three sequences.



(b) In a sequence, the sum of the first 49 terms is 7644. The sum of the first 50 terms is 7975.

Find the 50th term of this sequence.

Time ( <i>t</i> seconds)	Number of athletes
$216 < t \le 219$	9
$219 < t \le 224$	14
$224 < t \le 234$	14
$234 < t \le 244$	2
$244 < t \le 264$	3

The frequency table shows the time of each of 42 athletes in a race.

(a) Calculate an estimate of the mean time.



[3]



The diagram shows two right-angled triangles *PQS* and *RQT*. *PQR* and *QTS* are straight lines.

Calculate angle QTR.



 $x = \dots$  or  $x = \dots$  [3]

*A* is the point (17,9) and *B* is the point (23,39).

Find the equation of the perpendicular bisector of line *AB*. Give your answer in the form y = mx + c.





The diagram shows a horizontal container for water with a uniform cross-section. The cross-section is a semicircle.

The radius of the semicircle is 0.45 m and the length of the container is 4 m.

(i) Calculate the volume of the container.



Give your answer correct to the nearest integer.