Candidate Name	Centre Number	Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

MATHEMATICS 4004/1

PAPER 1

NOVEMBER 2022 SESSION 2 hours 30 minutes

Candidates answer on the question paper

Additional materials:
Mathematical Instruments

Allow candidates 5 minutes to count pages before the examination.

This booklet should not be punched or stapled and pages should not be removed.

Time 2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES

Write your Name, Centre number and Candidate number in the spaces at the top of this page.
Write your centre and candidate number in the box on the top right corner of every page of this paper.
Check that all the pages are in the booklet and ask the invigilator for a replacement if there are duplicate or missing pages.
Answer **all** questions.
Write your answers in the spaces provided on the question paper using **black** or **blue** pens.
If working is needed for any question, it must be shown in the space below that question.
Omission of essential working will result in loss of marks.
Decimal answers which are not exact should be given to three significant figures unless stated otherwise.
Mathematical tables, slide rules and calculators should not be brought into the examination room.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part question.

This question paper consists of 19 printed pages and 1 blank page.

Copyright: Zimbabwe School Examinations Council, N2022.

Candidate Name	Centre Number	Candidate Number

Answer all questions

NEITHER MATHEMATICAL TABLES NOR SLIDE RULES NOR CALCULATORS MAY BE USED IN THIS PAPER

1 **(a)** Express

one million and one in figures.

Answer (a) [1]

(b) $1\frac{3}{4}$ days in hours.

Answer (b) [1]

(c) $11,6^\circ$ in degrees and minutes.

Answer (c) [1]

2 **(a)** Solve the equation $13x = 377$.

Answer (a) [1]

(b) If vector $a + \begin{pmatrix} 3 \\ 4 \end{pmatrix} = \begin{pmatrix} 5 \\ 0 \end{pmatrix}$,

find vector a.

Answer (b)

[1]

(c) Write down the largest perfect square integer number less than 20.

Answer (c)

[1]

3 **(a)** Write the three figure bearing equivalent to North East.

Answer (a)

[1]

(b) Write the first three positive odd integers.

Answer (b)

[1]

(c) Express 0,0456 correct to one significant figure.

Answer (c)

[1]

4 Evaluate

(a) $\left(\frac{7}{8}\right)^{-1}$,

Answer (a)

[1]

(b) $\log_5 80 - \log_5 16$.

Answer (b)

[2]

5 **(a)** Simplify the expression $\frac{2x + 3y}{6x + 9y}$.

Answer (a)

[2]

(b) Find $\sqrt{5\frac{4}{9}}$

Answer (b)

[2]

6 Solve the equation $2x^2 - 5x - 3 = 0$.

Answer

[3]

7 Given that $f(d) = d^2 - 3d$,
find

(a) $f(3)$.

Answer (a)

(b) the values of d for which $f(d) = 10$. [1]

Answer (b)

Candidate Name | Centre Number | Candidate Number

8 Solve the simultaneous equations:

$3m - n = -7$
$2m + n = 17$

Answer

[3]

9 Given that $\xi = \{x : 49 \leq x \leq 58\}$ $x \in \mathbb{Z}$,

State from ξ, a

(a) prime number,

Answer (a)

[1]

(b) multiple of 19,

Answer (b)

[1]

(c) square number.

Answer (c)

[1]

Candidate Name	Centre Number	Candidate Number

10 Find the next **two** terms in the following sequences:

(a) $1;\ 3;\ 6;\ 10;\ 15; \ldots$

Answer (a)

[2]

(b) $16;\ 4;\ 1;\ \frac{1}{4}; \ldots$

Answer (b)

11 **(a)** Given that $11_a = 9_{10}$, find the value of a. [2]

Answer (a)

(b) Convert 202_7 to a number in base 5.

[2]

Answer (b)

12 Evaluate

(a) $\left(\frac{1}{3}+\frac{1}{4}\right)^2$,

Answer (a)

[2]

(b) $1\frac{1}{4} \div 1\frac{1}{2}$ leaving the answer in it lowest terms.

Answer (b)

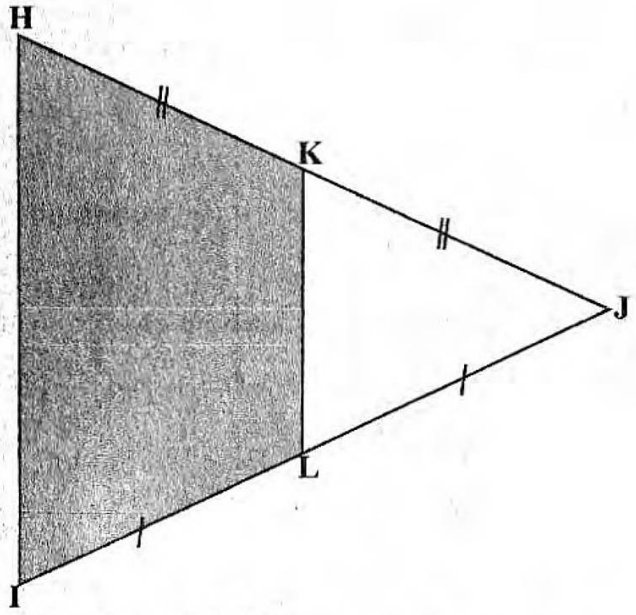
[2]

13 **(a)** State the number of lines of symmetry of a rhombus.

Answer (a)

[1]

(b)



The diagram above shows triangle HIJ.
Line HI is parallel to line KL. where L and K are midpoints of IJ and HJ respectively.
The area of triangle HIJ is 48 cm^2.
Calculate the area of the shaded quadrilateral HILK.

Answer (b)

[3]

14 Factorise completely

(a) $36p^4 - 4q^2$,

Answer (a)

[3]

Candidate Name | Centre Number | Candidate Number

(b) $10my + 15ny + 6m + 9n.$

Answer (b)

[2]

15 **(a)** Convert a speed of 10m/s to a speed in km/h.

Answer (a)

[2]

(b) Given that matrix $A = \begin{pmatrix} m & 6 \\ 12 & 2m \end{pmatrix}$ is singular, find the two possible values of m.

Answer (b)

[2]

16 A rectangle of length x metres and width of y metres is drawn according to these conditions:

a) The width is greater than one third of the length.
Find an inequality that satisfies this condition.

Answer (a)

[1]

(b) The perimeter is not less than 400 metres but less than 560 metres.
Find an inequality which satisfy this inequality.

Answer (b)

[3]

(a) Given that $n - 4 > 7$, find the smallest possible value of n if n is an integer.

Answer (a)

[2]

(a) A triangle ABC is such that $AB = 3\ cm,\ AC = 5\ cm,\ BC = x\ cm$ and $B\hat{A}C = 120°$.

Use as much of the information given below as is necessary to answer the question.

$$\left[\sin\ 60° = \frac{\sqrt{3}}{2};\ \cos\ 60° = \frac{1}{2};\ \tan\ 60° = \sqrt{3}\right]$$

Find the value of x.

Answer (b)

[3]

18 **(a)** The magnitude of vector $\begin{pmatrix} x \\ 3 \end{pmatrix}$ is 5. Find the possible values of x.

Answer (a)

[2]

(b) The universal set ξ has subsets A, B and C such that
$\xi = \{1;\ 2;\ 3;\ 4;\ 5;\ 6;\ 7;\ 8;\ 9\}$,
$A = \{x :\ x\ is\ a\ factor\ of\ 8\}$,
$B = \{2;\ 4;\ 8\}$
$C = \{x : x\ is\ a\ perfect\ square\ number\}$.

(i) List all elements of subset C.

Answer (b)(i)

[1]

(ii) Find $n(A \cup B)$.

Answer (b)(ii)

[1]

(iii) Write down the relationship between sets A and B in set notation.

Answer (b)(iii)

[1]

The midday temperature, in degrees celsius, for ten days in September in a certain town were recorded as follows:

18; 20; 22; 23; 26; 28; 22; 18; 18; 17.

(a) State the modal temperature.

Answer (a)

[1]

(b) Find the median temperature.

Answer (b)

[1]

(c) Find the temperature range.

Answer (c)

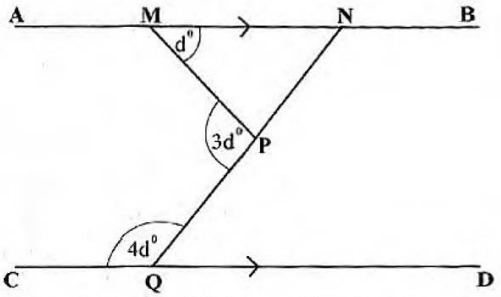
[1]

(d) Calculate the mean temperature.

Answer (d)

[2]

20 (a)



The diagram above shows two parallel lines AB and CD.
Line QN cuts the parallel lines at Q and N. Line PM cuts QN at P and AB at M
$C\hat{Q}P = 4d°$, $Q\hat{P}M = 3d°$ and $P\hat{M}N = d°$.

(i) Express $M\hat{N}P$ in terms of d.

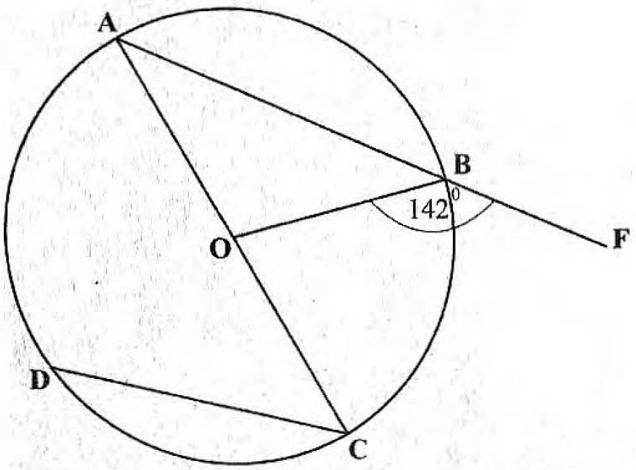
Answer (a)(i)

[1]

(ii) Calculate the value of d.

Answer (a)(ii)

(b)



The diagram above shows points A, B, C and D on the circumference of a circle centre O.
AB and DC are chords and AC is the diameter of the circle. Point F is on AB produced.
$F\hat{B}O = 142°$.
Calculate

(i) $B\hat{A}C$,

Answer (b)(i) .....

[1]

(ii) $B\hat{O}C$.

Answer (b)(ii) .....

21 **(a)** The interior angle of a regular polygon is $13x°$ and the exterior angle is $2x°$

(i) Calculate the value of x.

Answer (a)(i)

[2]

(ii) Find the number of sides of the regular polygon.

Answer (a)(ii)

[2]

(b) A bag contains 20 balls all identical except for colour. There are 3 green balls, 5 red balls and 12 brown balls.
One ball is picked at random from the bag, its colour noted and is replaced.
A second ball is picked at random and its colour noted and is replaced.
Calculate the probability that both balls are of the same colour.

Answer (b)

[2]

22 (a) The velocity, vm/s, of a moving particle after t seconds is given by the equation $v = 5 + 4t - t^2$.
Calculate the value of

(i) v when $t = 3$ seconds,

Answer (a)(i)

[1]

(ii) t when $v = 0$.

Answer (a)(ii)

[3]

(b) Make h the subject in the following formula, $A = 2\pi r^2 + 2\pi rh$.

Answer (b)

[2]

23 ABCD is an isosceles trapezium with AB = 5cm, DC = 17cm and AD = BC.
AB is parallel to DC.
The perimeter of the trapezium is 42cm.

Calculate the

(a) perpendicular distance between the two parallel sides,

Answer (a)

[4]

(b) area of the trapezium ABCD.

Answer (b)

[4]

24 A dealer made a profit of 20% on the buying price by selling a double bed for $180, 00

(a) Calculate the buying price.

Answer (a)

[2]

(b) Calculate the selling price if the same bed had been sold at a loss of 20%.

Answer (b) .....

[2]