Candidate Name   Centre Number   Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL
General Certificate of Education Ordinary Level

MATHEMATICS   **4004/1**
PAPER 1   2 hours 30 minutes

JUNE 2024 SESSION

Additional materials:
Mathematical Instruments

INSTRUCTIONS TO CANDIDATES

Write your Name, Centre number and Candidate number in the spaces at the top of each page.
Check that all the pages are in the booklet and ask the invigilator for a replacement if there are duplicate or missing pages.
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.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part question.
This paper is marked out of **100**.

This question paper consists of 28 printed pages.

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Answer **all** questions.

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

1   (a)   Simplify $0 - (-3)$

Answer (a) .... [1]

(b)   Express $\dfrac{8}{3}$ as a recurring decimal.

Answer (b) .... [1]

(c)   Find $\sqrt{1\dfrac{11}{25}}$.

Answer (c) .... [1]

3

2 **(a)** Simplify $2\frac{2}{3} \div 2$.

Answer (a) .... [1]

(b) Find the value of $9 + 6 \div 3$.

Answer (b) .... [1]

(c) Evaluate $0,032 \div 0,4$.

Answer (c) .... [1]

[Turn over

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3   Three learners A, B and C contributed $20, $30 and $50 respectively. They bought a packet of sweets with 150 sweets worth $100.

(a)   Write down the ratio of the money they contributed in an ascending order in its simplest form.

Answer (a)

....

[1]

(b)   If the three leaners shared the sweets in the ratio of the money they contributed.

Calculate the number of sweets C got.

Answer (b)

....
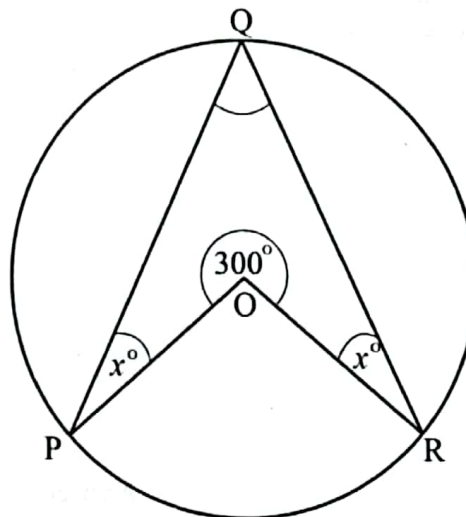
[2]

4004/1 J2024

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4   Two hills A and B are 3 km apart.

Hill A is 150 metres above sea level.

The person on top of the hill A sees the peak of hill B at an angle of elevation of $15°$.

Use as much information given below as is necessary:

[Sin 15°=0,2588 ; Cos 15°=0,9659 Tan 15°=0,0875]

Find the height of hill B above sea level.

Answer

....

[3]

5

In the diagram points P, Q and R are on the circumference of a circle, centre O.

$P\hat{O}R = 300°$, $Q\hat{P}O = Q\hat{R}O = x°$,

[Turn over

Find

(a) $P\hat{Q}R$

Answer (a) ....
[1]

(b) x.

Answer (b) ....
[2]

6   Solve the simultaneous equations:

$$x = 3 - 3y$$
$$2y = x - 8$$

Answer
....
....
[3]

7   A rectangular wall measuring 6m by 5m has a window measuring 1,5m by 1,2 m.
     The wall needs to be painted.
     Calculate the area of the wall to be painted.

Answer
....

[3]

8   The Universal set ξ has subsets A and B, such that ,
     $\xi = \{x : 1 \leq x \leq 20 , x \text{ is an integer} \}$,
     $A = \{x : x < 10\}$,
     $B = \{x : x \text{ is a perfect cube}\}$.

     (a)   List all elements of,

            (i)   B,

Answer (a)(i)
....

[1]

[Turn over

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(ii)   A∩B,

Answer (a)(ii) ....

[1]

(b)   Hence or otherwise state the relationship between sets A and B.

Answer (b) ....

[1]

9   (a)   Express 732×10^{-1} in standard form.

Answer (a) ....

[1]

(b) Three towns A, B and C are situated along a straight road, such that town C is (4×10^2) km from town A and town B is $(1,88 \times 10^2)$ km from town A.

Find the distance of town B from town C.

Give the answer in standard form.

Answer (b) ....

[2]

10 **(a)** Round off,

(i) $9\ 995,85 correct to the nearest $10.

Answer (a)(i) ....

[1]

(ii) $3\frac{1}{5}\ cm$ correct to the nearest centimetre.

Answer (a)(ii) ....

[1]

[Turn over

(b) **(i)** Express 432 as a product of its prime factors.

Answer (b)(i)

.... [1]

(ii) Hence find the smallest number by which 432 must be multiplied to get a result which is a perfect square.

Answer (b)(ii)

.... [1]

11 **(a)** A greengrocer bought 80 oranges for $640 and sold them at $15 each. Find the percentage profit made.

Answer (a)

.... [2]

(b) A woman invested $4 000 in a bank at 3% simple interest.
The money earned an interest of $240.
Find the time her money was in the bank.

Answer (b) ....

[2]

12   Learner P walks to school every day which is 5km from the learner's home. In order for the learner to reach the school at 0715, the time at which the lessons commence, the learner leaves home at 0545.

(a)   Write 0545 as a time in 12- hour notation.

Answer (a) ....

[1]

[Turn over

(b) On one of the days, learner P arrived at school at 0725.

(i) Find the time by which learner P was late for the lessons.

Answer (b)(i) ....

[1]

(ii) Calculate the average speed, in km/h, at which learner P was walking on the day that the learner was late.
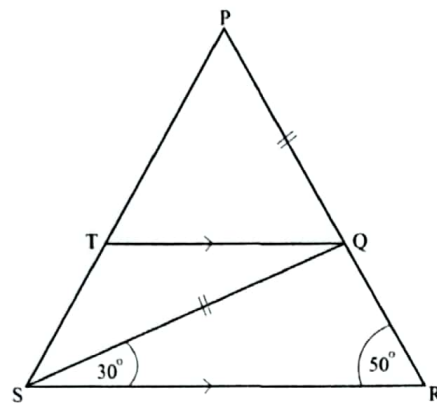
Answer (b)(ii) ....

[2]

13

In the diagram triangle PSR is such that

QT is parallel to RS, $Q\hat{R}S = 50°$, $Q\hat{S}R = 30°$ and PQ = QS.

Find

(a) $S\hat{Q}T$,

Answer (a) ....

[1]

(b) $T\hat{Q}P$,

Answer (b) ....

[1]

(c) $P\hat{T}Q$,
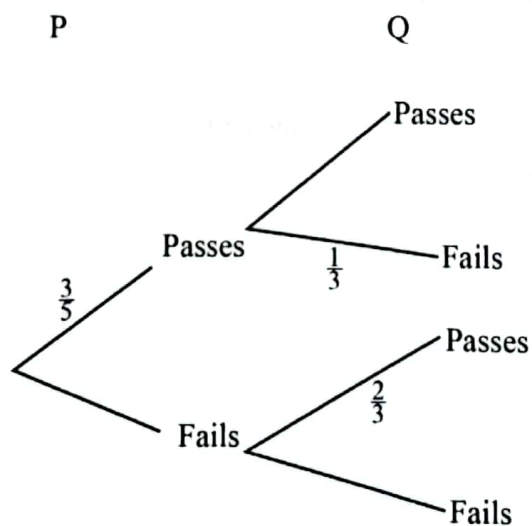
Answer (c)
....
[2]

14   Two learners P and Q write a Mathematics test.

The probability that P passes the test is $\dfrac{3}{5}$.

The probability that Q passes the test is $\dfrac{2}{3}$.

(a)   Complete the tree diagram below by inserting the probabilities not given.

P   Q

```
                                          Passes
                          Passes
            3/5                   1/3     Fails
                                          Passes
                                   2/3
                          Fails
                                          Fails
```

Answer (a) on the
diagram
....
[2]

(b)   Find the probability that only one of the learners passes the test

Answer (b) ....

[2]

15   (a)   Factorise completely,

(i) $4x - 2y$,

Answer (a)(i) ....

[1]

(ii) $4x^2 - y^2.$

Answer (a)(ii) ....

[2]

4004/1 J2024

[Turn over

(b)   Hence or otherwise, find L.C.M of $4x - 2y$ and $4x^2 - y^2$.

Answer (b) ....

[1]

16   The table below, contains distance covered, in km, per given litres of fuel.

Number of litres (l)	0,5	10	30	50
Distance (D) in km	7,5	150	450	750

(a)   State the type of variation connecting the two quantities

Answer (a) ....

[1]

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(b) Express D in terms of l,

Answer (b) ....

[2]

(c) Calculate amount of fuel in litres, that will be required for a distance of 480 km.

Answer (c) ....
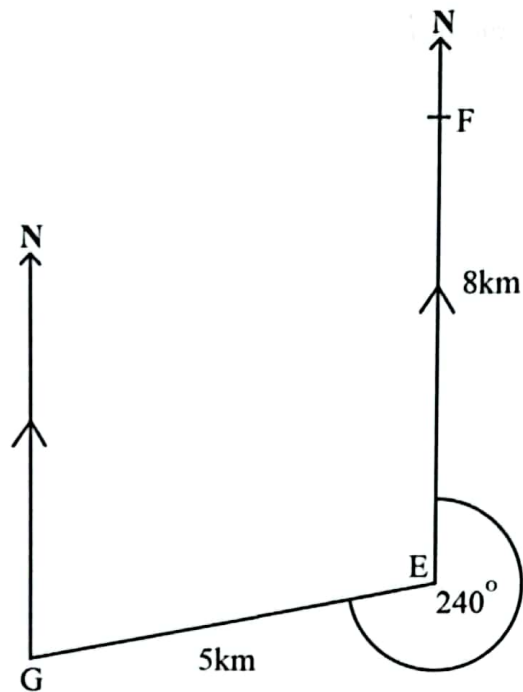
[2]

17

In the diagram above, school F is $8km$ due north of school E.
School G is $5km$ from school E on a bearing of $240°$.

(a)   Find the compass bearing of school E from school G.

Answer (a)

....

[2]

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(b) Calculate the distance of school F from school G, leaving the answer in surd form.

Answer (b) ....

[3]

18 **(a)** Given that, $\begin{pmatrix} 1 & 2 \\ 6 & 3 \end{pmatrix} - \begin{pmatrix} 4 & 7 \\ 3y & 10 \end{pmatrix} = \begin{pmatrix} -3 & -5 \\ 9 & -7 \end{pmatrix}$

find the value of y.

Answer (a) ....

[1]

(b)   Simplify $\begin{pmatrix} 2 \\ 3 \end{pmatrix} \begin{pmatrix} 1 & -3 \end{pmatrix}$

Answer (b) ....

[2]

(c)   Given that $\begin{pmatrix} 1 & -x \\ -2 & 9 \end{pmatrix}$ is the inverse of $\begin{pmatrix} 9 & x \\ 2 & 1 \end{pmatrix}$,

find the value of x.

Answer (c) ....

[2]

19 **(a)** Write down the value of 1 in the number 610_7.

Answer (a) ....

[1]

(b) Evaluate $1\,016_9 + 881_9$, giving the answer in base 9.

Answer (b) ....

[1]

(c) Evaluate $140_5 - 123_5$, giving the answer in base 2.

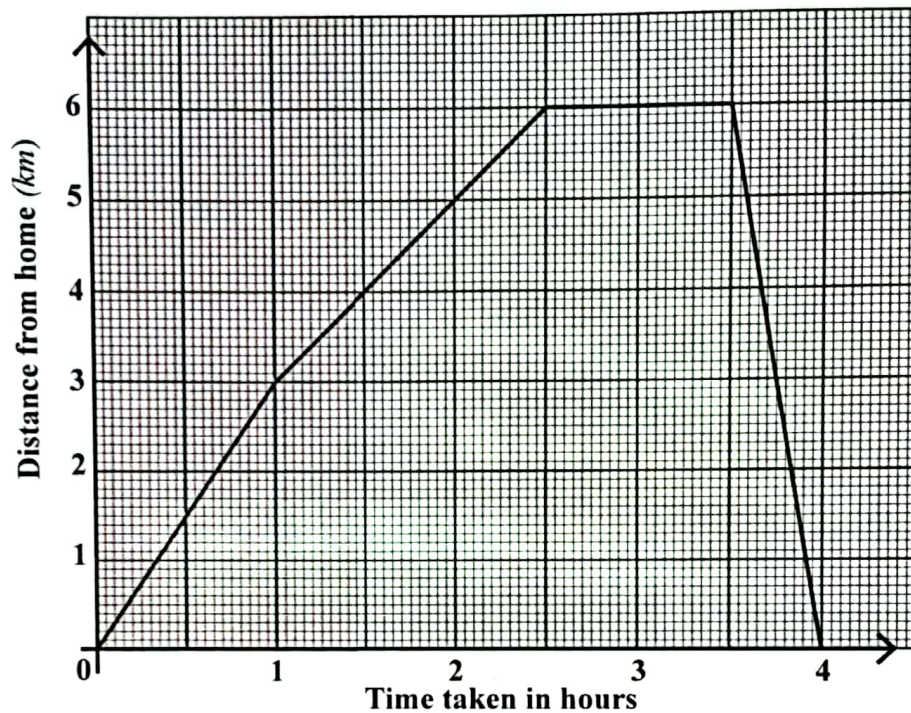Answer (c) ....

[3]

[Turn over

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20

A man went for a walk. He left home at 9. 30 am. His displacement - time graph is given in the graph above.

Find the

(a)   time he arrived back home,

Answer (a)
....
[1]

(b) total distance he walked,

Answer (b)

....

[1]

(c) average speed for the whole journey in km/h,

Answer (c)

....

[2]

(d) amount of time the man rested.

Answer (d)

....

[1]

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24

21 **(a)** Evaluate,

    (i) $\quad 2^3 + 2^2$,

Answer (a)(i) ....

[1]

    (ii) $\quad -\left(7x^2\right)^0$,

Answer (a)(ii) ....

[1]

    (iii) $\quad \left(2^3\right)^{-\frac{2}{3}}$.

Answer (a)(iii) ....

[1]

(b) Solve the equation $3^x \times 3^{2x} = 27$.

Answer (b) ....

[3]

22
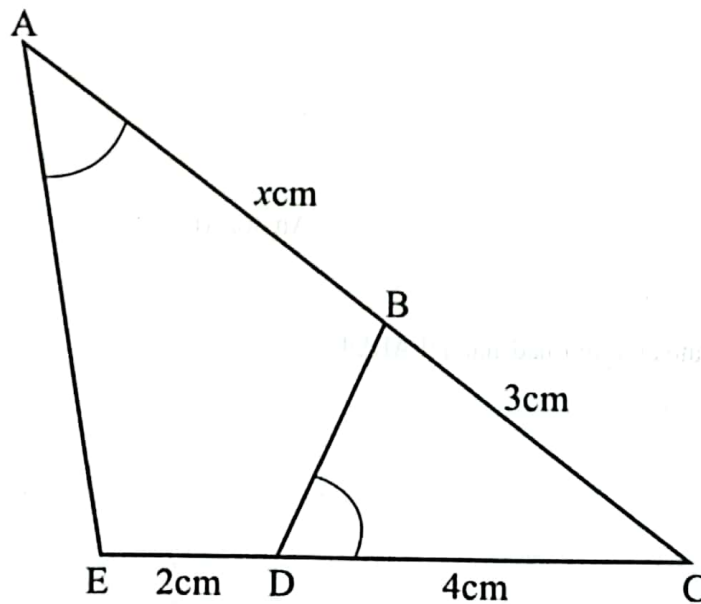
In the diagram above, $E\hat{A}C = B\hat{D}C$, $AB = x\,cm$, $BC = 3cm$, $DC = 4cm$ and $ED = 2cm$. Area of triangle $ACE = 24cm^2$.

[Turn over

CamScanner

26

(a)   Name a triangle which is similar to triangle ACE.

Answer (a) ....

[1]

(b)   Find x

Answer (b) ....

[2]

(c)   Calculate area of quadrilateral ABDE.

Answer (c) ....

[3]

23   An 11 sided polygon has 9 of its exterior angles which are each $x°$ and 2 which are each $y°$. The sum of 9 interior angles adjacent to angle $x°$ of the polygon is $1152°$ more than the sum of the 2 interior angles adjacent to angle $y°$ of the polygon.

(a)   Form two simultaneous equations in x and y using the given information above.

Answer (a)

....

....

[3]

(b)   Solve the simultaneous equations in (a).

Answer (b)

....

....

[3]

[Turn over

24   A straight line l, passes through the point $(2 ; -3)$ and has gradient of 3.

(a)   (i)   Find the equation of line l in the form $y = mx + c$.

Answer (a)(i) ....

[2]

(ii)   State the relationship between line l and the line whose equation is
$y = 3x - 1$.

Answer (a)(ii) ....

[1]

(b)   Given that $f(x) = 2x + k^2$ and that $f(2) = 29$,
find the two possible values of k.

Answer (b) ....

[3] **4521**