Candidate Name	Centre Number	Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

MATHEMATICS 4008/1, 4028/1

PAPER 1

NOVEMBER 2008 SESSION 2 hours 30 minutes

Candidates answer on the question paper.
Additional materials:
Geometrical instruments

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.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.
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 correct 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.

FOR EXAMINER'S USE

This question paper consists of 26 printed pages and 2 blank pages.

[Turn over

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

For Examiner's Use

1 **(a)** Simplify

(i) $6{,}3 \times 1{,}1$, giving your answer as a decimal,

(ii) $\frac{2}{3} - \frac{3}{4}$, giving your answer as a common fraction.

(b) Find 5% of 130 metres.

Answer *(a)* *(i)* _____ [1]

(ii) _____ [1]

(b) _____ m [2]

For Examiner's Use

2 (a) Evaluate $54_6 + 305_6$, giving your answer in base 6.

(b) Convert 10011_2 to a number in base 3.

Answer *(a)* _____ [1]

(b) _____ [2]

---

3 Given that $94 \times 152 = 14\,288$,

(a) find the value of N if $95 \times 152 = 14\,288 + N$.

(b) Write down the exact value of

(i) $0{,}094 \times 1\,520$.

(ii) $0{,}14\,288 \div 0{,}0094$.

Answer *(a)* _____ [1]

(b) *(i)* _____ [1]

(ii) _____ [1]

4 (a) Simplify $(0.2)^3 \times (0.2)^2$, giving your answer as a decimal.

For Examiner Use

(b) Solve the equation

$$5x - 2(x + 3) = 9.$$

Answer (a) _____ [1]

(b) $x =$ _____ [2]

5 (a) Write 0019 in 12-hour notation.

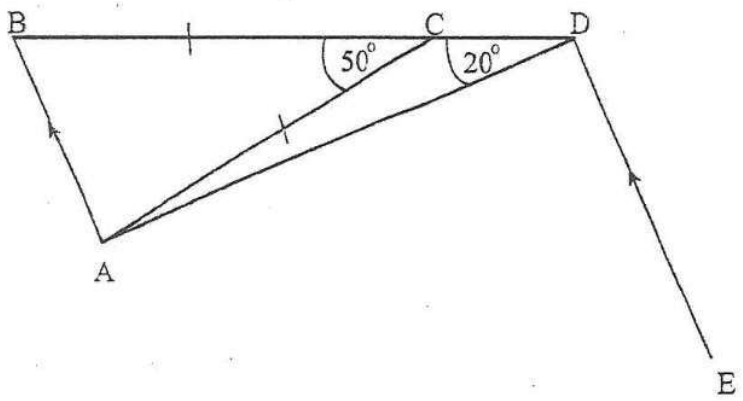
(b) Tapiwa and Netsai share some money in the ratio 2: 5. Given that Tapiwa's share is \$620 000, calculate Netsai's share.

For Examiner's Use

Answer (a) _____ [1]

(b) \$_____ [2]

6



For Examiner's Use

In the diagram, BCD is a straight line and AB is parallel to ED. Given that BC = AC, $A\hat{D}B = 20°$ and $A\hat{C}B = 50°$, calculate

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

(b) $D\hat{A}C$,

(c) $A\hat{D}E$.

Answer *(a)* $B\hat{A}C =$ _____ [1]

(b) $D\hat{A}C =$ _____ [1]

(c) $A\hat{D}E =$ _____ [1]

7 Given that $m = 4 \times 10^6$ and $n = 2{,}4 \times 10^{-3}$ giving each answer in standard form, calculate

For Examiner's Use

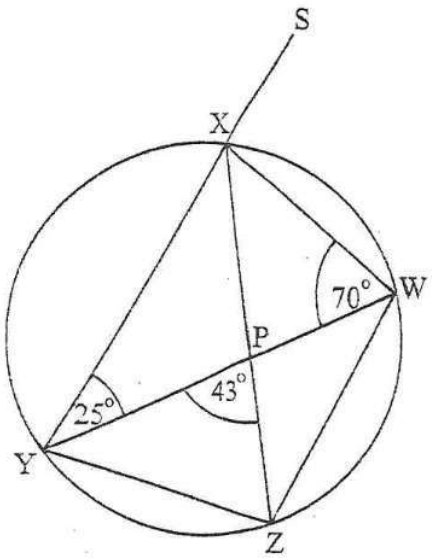
(a) mn,

(b) $\frac{n}{m}$.

Answer (a) _____ [1]

(b) _____ [2]

8



WXYZ is a cyclic quadrilateral. The diagonals XZ and YW intersect at P and YX is produced to S. $Y\hat{W}X = 70°$, $X\hat{Y}P = 25°$ and $Y\hat{P}Z = 43°$.

Calculate

(a) $X\hat{Z}Y$,

(b) $Y\hat{X}Z$,

(c) $S\hat{X}W$.

Answer *(a)* $X\hat{Z}Y =$ _____ [1]

(b) $Y\hat{X}Z =$ _____ [1]

(c) $S\hat{X}W =$ _____ [1]

9 (a) The bearing of town B from town A is 141°. Find the bearing of town A from town B.

(b) The interior angle of a regular polygon is 162°. Find the number of sides of the polygon.

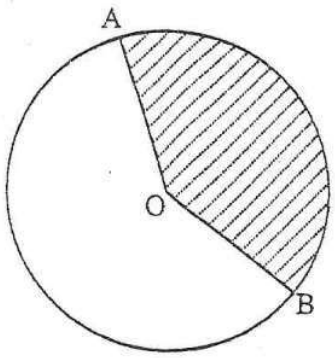
For Examiner's Use

Answer (a) _____ [1]

(b) _____ [2]

10

For Examiner's Use



(a) In the diagram, the shaded sector AOB is $\frac{7}{15}$ of the circle centre O.

Calculate $A\hat{O}B$.

(b) Calculate the radius of a circle whose area is 154 cm^2.

[Take π to be $\frac{22}{7}$]

Answer *(a)* _____ [1]

(b) _____cm [2]

For Examiner's Use

11 Taurai is x years old. Zvikomborero, her brother is 9 years older than her. Their father is 3 times as old as Taurai. Their mother is twice as old as Zvikomborero.

(a) Write down and simplify, in terms of x, an expression for the total age of the four members of the family.

(b) Given that the sum of the ages of the four members is 139 years, find the value of x.

Answer (a) _____ [4]

(b) $x =$ _____ [2]

For Examiner's Use

12 The scale of a map is 1: 1 000 000.

Find

(a) the length, in cm, of a line on the map, which represents a road 160 km long,

(b) the actual area of a piece of land which is represented by 2,64 cm^2 on the map, giving your answer in km^2.

Answer (a) _____ cm [2] [1]

(b) _____ km^2 [2]

For Examiner's Use

13 If $f(x) = x^2 - 7x + 5$, find

(a) $f(-1)$,

(b) the values of x for which $f(x) = -7$.

Answer *(a)* _____ [1]

(b) $x =$ _____ or _____ [2]

For Examiner Use

14 A bag contains red, blue and green counters all of which are identical except for colour.

A counter is picked at random from the bag. Its colour is noted and then it is replaced. The probability that it is red is 0,2 and the probability that it is blue is 0,5.

(a) Calculate the probability that the counter picked is either blue or green.

(b) Two counters are picked at random one after the other, with replacement. Calculate the probability that one is red and the other is blue.

Answer (a) _____ [1]

(b) _____ [2]

15 (a) Factorise $x^2 - y^2$.

(b) Given that $x - y = 4$ and $x^2 - y^2 = 20$, find the value of x and the value of y.

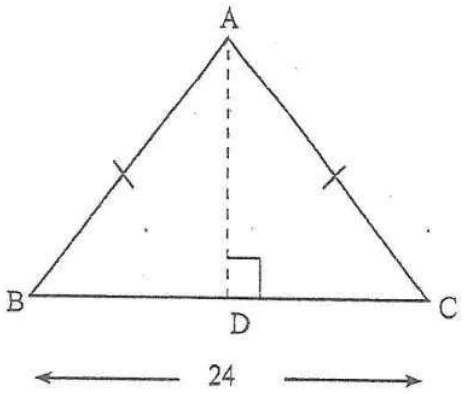
For Examiner's Use

Answer (a) _____ [1]

(b) $x =$ _____ [1]

$y =$ _____ [3]

16



The diagram shows an isosceles triangle ABC with AB = AC, BC = 24 cm and AD is perpendicular to BC.

Given that the area of the triangle is 108 cm^2, find

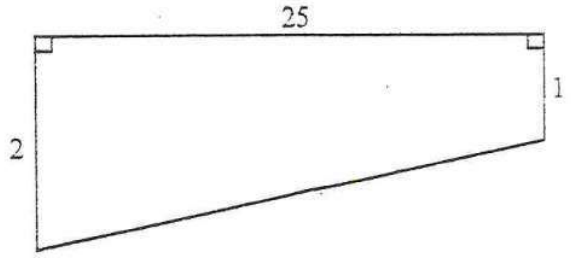
(a) AD,

(b) AC.

Answer *(a)* AD = _____ cm [2]

(b) AC = _____ cm [2]

17



The diagram shows a cross-section of a swimming pool which is 25 m long, 1 m deep at the shallow end and 2 m deep at the deep end.

(a) Calculate the area of the cross-section in m^2.

(b) Given that the swimming pool is 10 m wide, calculate the volume of the pool in m^3.

Answer *(a)* _____ m^2 [2]

(b) _____ m^3 [2]

For Examiner's Use

For Examiner Use

18 Given that $\log_5 2 = 0{,}431$ and $\log_5 3 = 0{,}683$, find the value of

(a) $\log_5 1\frac{1}{2}$,

(b) $\log_5 \sqrt{3}$.

Answer (a) _____ [2]

(b) _____ [2]

19 (a) It is given that $\overrightarrow{AB} = \begin{pmatrix} 2 \\ 4 \end{pmatrix}$ and $\overrightarrow{BC} = \begin{pmatrix} -8 \\ 6 \end{pmatrix}$.

Find

(i) $\overrightarrow{AC}$,

(ii) $\overrightarrow{CX}$, given that $2\overrightarrow{CX} = \overrightarrow{BC}$.

(b) P is the point (−3; 2) and $\overrightarrow{PQ} = \begin{pmatrix} 3 \\ -5 \end{pmatrix}$.

Find the coordinates of point Q.

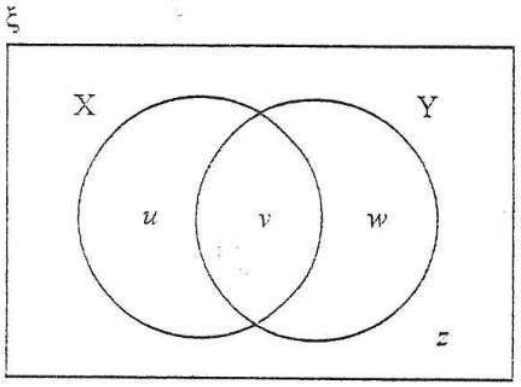
Answer *(a)* (i) $\overrightarrow{AC} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

(ii) $\overrightarrow{CX} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

(b) (_____ ; _____) [2]

20

For Examiner's Use



The Venn diagram shows the universal set ξ, set X and set Y. The letters u, v, w and z represent the numbers of elements in each subset.

It is given that $n(\xi) = 150$; $n(X) = 55$ and $n(Y) = 32$.

Find

(a) the smallest possible value of z,

(b) the largest possible value of v,

(c) the value of w if $u = 45$.

Answer (a) _____ [1]

(b) _____ [1]

(c) _____ [1]

For Examiner's Use

21 (a) During a sale, a shop reduced all its prices by 20%. Calculate the original price of an article which was sold during the sale for \$440 000.

(b) On a particular day, a bank bought British pounds (£) at a rate of 1 British pound (£) to 35 000 Zimbabwean dollars (\$) and sold British pounds (£) at a rate of \$40 000 per £.

Calculate

(i) the amount, in British pounds, bought for \$10 500 000,

(ii) the amount, in Zimbabwean dollars, received for selling £112.

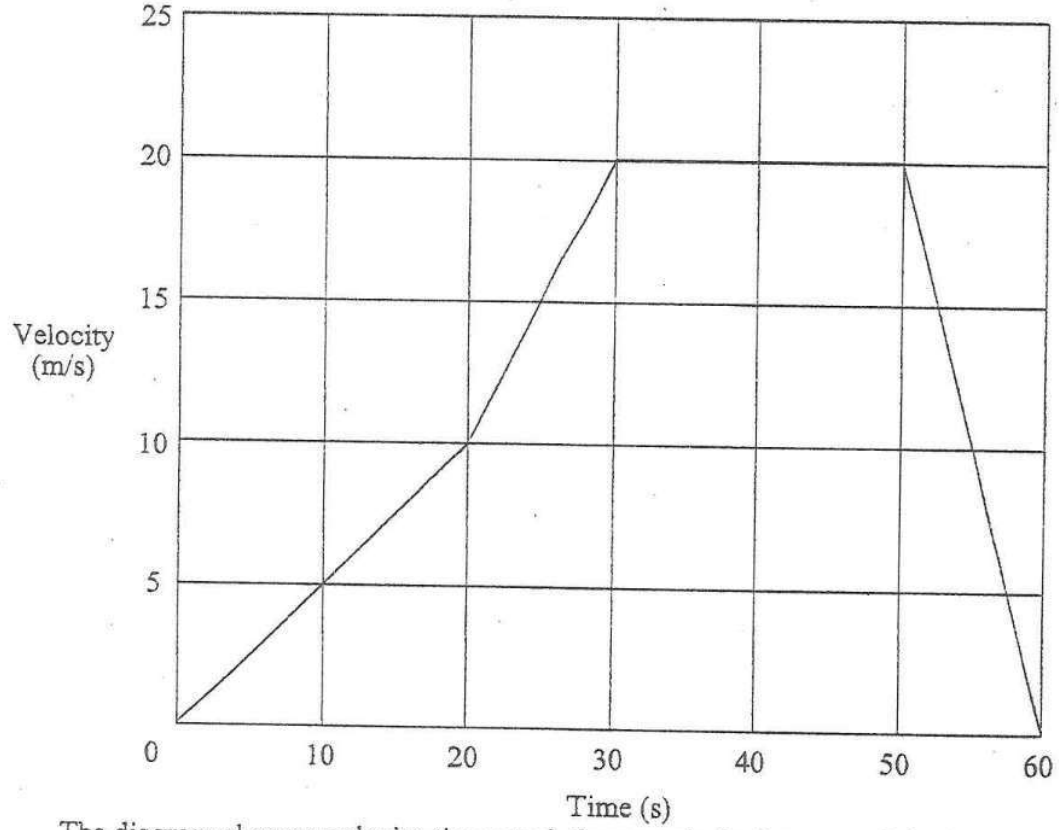
Answer *(a)* \$ _____ [2]

(b) *(i)* £ _____ [2]

(ii) \$ _____ [1]

22

For Examiner's Use



The diagram shows a velocity-time graph for a particular journey. Calculate

(a) the distance travelled in the first 30 seconds,

(b) the speed when the time is 40 seconds,

(c) the deceleration during the last 10 seconds.

Answer (a) _____ m [2]

(b) _____ m/s [1]

(c) _____ m/s^2 [2]

For Examiner's Use

23 x is partly constant and partly varies as y.

(a) Express x in terms of y and constants h and k.

(b) Given that $x = 1$ when $y = 8$ and that $x = 3$ when $y = 12$, calculate the value of

(i) h,

(ii) k.

(c) Find the value of x when $y = 30$.

Answer (a) $x =$ _____ [1]

(b) (i) $h =$ _____ [1]

(ii) $k =$ _____ [1]

(c) $x =$ _____ [2]

24

For Examiner Use

Mark	0	1	2	3	4	5	6	7	8	9	10
No of pupils who scored this mark	0	1	3	7	9	5	2	2	1	2	0

The table shows the test results of a class of pupils. The test was marked out of 10.

(a) Find

(i) the number of pupil, in the class,

(ii) the modal mark,

(iii) the range of marks scored by the pupils.

(b) Calculate the percentage of pupils who scored less than 5 marks.

Answer *(a)* *(i)* _____ [1]

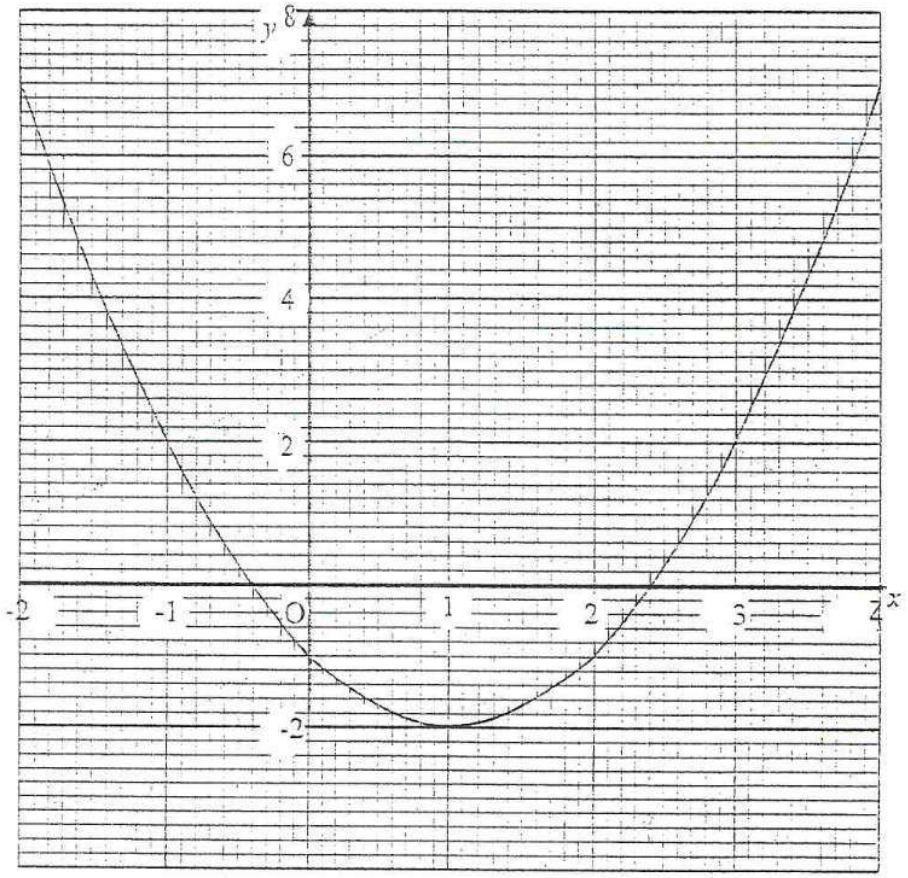
(ii) _____ [1]

(iii) _____ [1]

(b) _____ % [2]

25

For Examiner's Use



The diagram shows the graph of the function $y = x^2 - 2x - 1$. Use the graph to find

(a) the roots of the equation $x^2 - 2x - 1 = 0$,

(b) the minimum value of $x^2 - 2x - 1$,

(c) the equation of the line of symmetry,

(d) the area enclosed by the curve, the x-axis, the y-axis and the line $x = 2$.

Answer (a) $x =$ _____ or _____ [2]

(b) _____ [1]

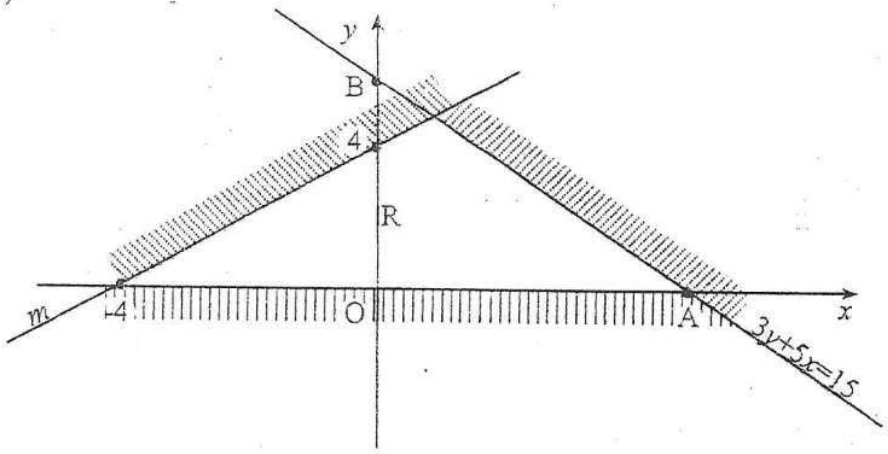
(c) _____ [1]

(d) _____ [2]

For Examiner's Use

26 (a) Solve the equation $(2x-3)^2 = 9$.

(b)



In the diagram, line m passes through the points $(-4; 0)$ and $(0; 4)$. The line $3y + 5x = 15$ cuts the x-axis and the y-axis at A and B respectively.

(i) Write down the coordinates of A and the coordinates of B.

(ii) Find the equation of line m.

(iii) Write down two inequalities, other than $y \geq 0$, which define the region R.

Answer (a) $x =$ _____ or _____ [2]

(b) (i) A(_____ ; _____)

B(_____ ; _____) [2]

(ii) _____ [2]

(iii) _____ [2]