# ZIMBABWE SCHOOL EXAMINATIONS COUNCIL
## General Certificate of Education Ordinary Level

**MATHEMATICS** **4008/1, 4028/1**
**PAPER 1**

**NOVEMBER 1999 SESSION** **2 hours 30 minutes**

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

1. Express 0,072

   (a) as a fraction in its lowest terms,
   (b) as a percentage,
   (c) in standard form.

Answer (a) _____

(b) _____

(c) _____

---

2. Find the value of

   (a) 5,08 + 0,946,
   (b) $\sqrt{0,0081}$,
   (c) 5,6 – 7,5.

Answer (a) _____

(b) _____

(c) _____

---

3. (a) Simplify $2m(3m + n) – 5m^2$

(b) Given that $f(x) = 3 – 5x$, find

(i) f(4)
(ii) f(7a).

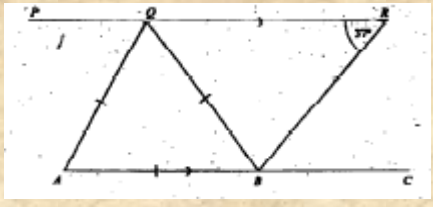
Answer (a) _____ [1]

(b) (i) _____ [1]

(ii) _____ [1]

---

4.



In the diagram, the lines ABC and PQR are parallel. The triangle AQB is equilateral. Given that QRB = $37^o$, calculate

(a) RBC,
(b) AQR,
(c) QBR.

Answer (a) RBC = _____ [1]

(b) AQR = _____ [1]

(c) QBR = _____ [1]

---

5. ABCD is a rhombus whose diagonals meet at O.

State

(a) the number of lines of symmetry of the rhombus,
(b) the order of rotational symmetry of the rhombus,
(c) the size of $A\hat{O}B$.

Answer (a) _____

(b) _____

(c) _____

---

6. A solid rectangular block meaning 6m x 5m x 2m is made up of metal whose density 7850 $kg/m^3$.

(a) Find the mass of the block in tonnes.
(b) Convert 7850 $kg/m^3$ to $g/cm^3$.

Answer (a) _____tonnes [2]

(b) _____ $g/cm^3$ [1]

---

7. The cost of 5 rulers is $11,25. The cost of 3 rulers and a pen is $9,35. Calculate the cost of

(a) a ruler.
(b) a pen.

Answer (a) $_____ [1]

(b) $ _____[2]

---

8. The minimum temperatures recorded in degrees Celsius on six consecutive days were as follows:

6, 3, -2, 6 -1, 0.

(a) Write down

(i) the lowest temperature recorded;
(ii) the modal temperature.

(b) Calculate the median temperature.

Answer (a) (i) _____$^{o}$C [1]

(ii) _____$^{o}$C [1]

(b) _____$^{o}$C [1]

9. Solve the simultaneous equations

$3x + 2y = -14$,

$3x - 5y = 56$.

Answer $x =$ _____

$y =$ _____

10. The exchange rate on a certain day was 3,8 dollars for 1 rand.

Calculate the equivalent of

(a) 150 rands in dollars,
(b) 304 dollars in rands.

Answer (a) $ _____ [1]

(b) _____ [2]

11.

Answer x = _____ or _____ [3]

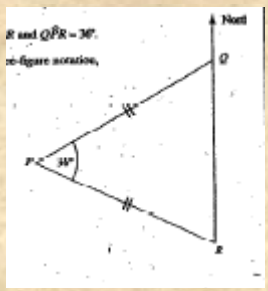
---

12. In the diagram, Q is due north of R. PQR is an isosceles triangle wit PQ = PR and QPR = $36^{o}$.

(a) Calculate, giving each answer in three-figure notation,

(i) the bearing of Q from P,
(ii) the bearing of P from R.

(b) Calculate reflex QPR.



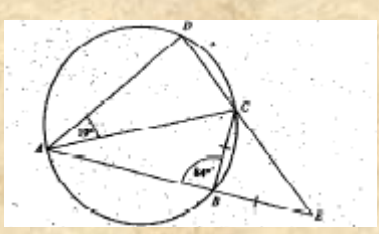
Answer (a) (i) _____ [1]

(ii) _____ [1]

(b) reflex QPR = _____ [1]

---

13.



In the diagram, ABCD is a cyclic quadrilateral. DC produced meets AB produced at E. given that BC = BE, ABC = $84^o$ and D$\hat{A}$C = $19^o$, calculate

(a) B$\hat{C}$E,
(b) ADC,
(c) C$\hat{A}$B.

Answer (a) B$\hat{C}$E = _____

(b) ADC= _____

(c) C$\hat{A}$B = _____

---

14. (a) (i) Solve the inequality $3x - 5 > 21$.

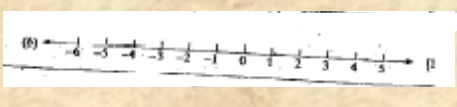
(ii) Write down the smallest integer value of x for which $3x - 5 > 21$.

(b) Illustrate the inequality $-4 < x \leq 2$ on the number line shown in the answer spa below.

Answer (a) (i) _____ [1]

(ii) _____ [1]

(b)



---

15. The scale on a map is such that 6 cm on the map represents 2,5 km on the ground. Calculate

(a) the length, in kilometers, of a road which measures 42 cm on the map,

(b) the area on the map, in square centimeters, that represents a lake of area 8 $km^2$.

Answer (a) _____km[1]

(b) _____$cm^2$ [2]

---

16. (a) Evaluate $234_5 + 142_5$, giving your answer in base 5.

(b) Subtract 28 minutes 27 seconds from 58 minutes 4 seconds, giving the answer in minutes and seconds.

(c) Convert 2 days, 6 hours and 27 minutes to minutes.

Answer (a) _____ [1]

(b) _____ min _____s [1]

(c) _____ min [1]

---

17. Find the value of

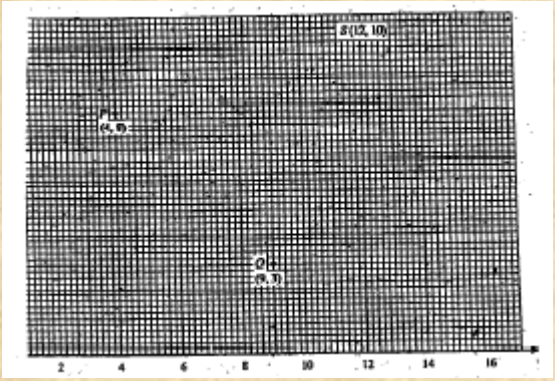
(a) $7^2 + 4^0$,
(b) $3\sqrt{2^6} \times 27$.

Answer (a) _____

(b) _____

---

18.



The diagram above shows points P(4, 8), Q(9, 3) and S(12, 10).

(a) Write down PQ in column vector form.

(b) Mark and label on the diagram

(i) the point R such that PQRS is parallelogram,
(ii) the point T, the image of S, under a clockwise rotation of $90^{o}$ about P.

Answer (a) PQ = $\begin{pmatrix} & \\ & \\ & \end{pmatrix}$ [1]

(b) (i) on diagram [1]

(ii) on diagram [1]

---

19. (a) Measured correct to the nearest centimeter, the sides of a kite are 15 cm and 12 cm. Find the smallest possible perimeter of the kite.

(b) Estimate, correct to one significant figure, the value of $\frac{94,6}{0,0627}$.

Answer (a) _____ cm

(b) _____

---

20. There are 500 pupils at a school.
Given that one in every form pupils rides to school, calculate

(a) the number of pupils who ride to school,

(b) the probability that

(i) a pupil chosen at random does not ride to school,
(ii) two pupils chosen at random ride to school.

Answer (a) _____ [1]

(b) (i) _____ [1]

(ii) _____ [1]

---

21. Two of the

(a) Calculate the sizes of the two angles.

(b) Given that the remaining three angles are in the ratio of 3: 4: 5, calculate the size of the largest of those angles.

Answer (a) _____ [1]

_____ [1]

(b) _____ [2]

---

22. (a) Given that $\frac{2}{x} = \frac{5}{p+q}$. express x in terms of p and q.

$x - 3p \quad q$

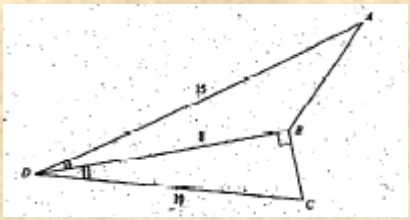
(b) Express $\frac{5m}{8} - \frac{2m + 3}{4}$ as a single fraction in its simplest form.

Answer (a) x = _____ [2]

(b) _____ [2]

---

23.



In the diagram DBC = $90^o$, ADB = BDC, AD = 15 cm, DB = 8 cm and DC = 10 cm.

(a) Calculate BC,

(b) Find cos BDC,

(c) Calculate $AB^2$

Answer (a) BC = _____cm

(b) cos BDC = _____

(c) $AB^2$ = _____

---

15. (a)

Find the value of x.

(b) The matrix $\begin{pmatrix} y^2 & 2 \\ 18 & 1 \end{pmatrix}$ is singular.

Calculate the two possible values of y.

Answer (a) x = _____ [2]

(b) y = _____ or _____ [3]

---

25. A bus left Bulawayo for Kwekwe with 60 passengers. It passes through Gweru (it stop) where it picked up 27 passengers and dropped off n passengers.

(a) Write down, in terms of n, the number of passengers in the bus as it left Gweru

(b) Given that it arrived in Kwekwe with 2n passengers, form an equation in n and n find the value of n.

(c) Did the bus gain or lose passengers in Gweru? Explain your answer.

Answer (a) _____

(b) Equation _____

n = _____

(c) _____

Explanation:_____

_____

_____

26. A cyclist starts a 30 km journey at 09 00. she maintains an average speed of 20 km/h for the first three – quarters of an hour and their rests. Subsequently she continues her journey at an average speed of 25 km/h arriving at her destination at 11 00.

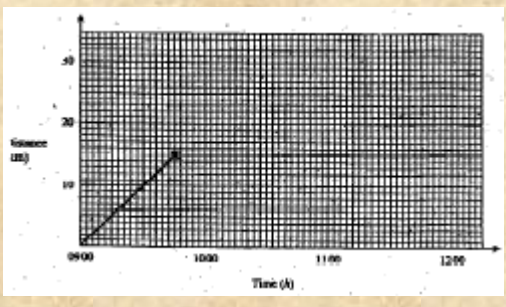
(a) Calculate the distance covered in the first three-quarters of an hour.
(b) Calculate, in hours, the time taken to cover the last part of the journey.
(c) Calculate, in minutes, the duration of her rest.
(d) The graph shown in the answer space is an incomplete distance time graph for the cyclist. Complete the graph.

Answer (a) _____km[1]

(b) _____h [1]

(c) _____min [1]

(d) On graph [2]



27. It is given that $\log_{10}50 = 1{,}69897$ correct to five decimal places.

(a) Write down $\log_{10}50$ correct to 4 decimal places.

(b) Evaluate, giving each answer correct to 4 decimal places,

(i) $\log_{10}5$,
(ii) $\log_{10}25$.

(c) Evaluate, giving the answer correct to 3 decimal places, $\log_{10}2$

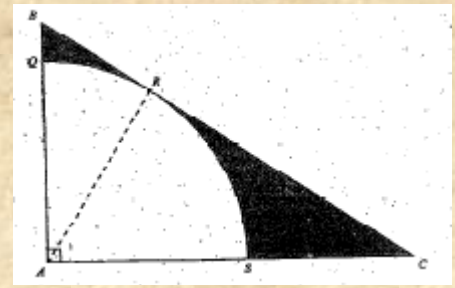
Answer (a) _____

(b) (i) _____

(ii) _____

(c) _____

28.



In this question take л to be 3,14.

The diagram shows the right angled triangle ABC
The sector AQRS is drawn inside it such that BRC is a tangent to the sector at R
Given that AB = 15 cm, AC = 20 cm and BC = 25 cm, calculate

(a) the area of the triangle ABC,

(b) the radius, AR, of the sector AQRS,

(c) the area of the shaded region.

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

(b) AR = _____ cm [2]

(c) _____ $cm^2$ [3]