Name ..... Index No. ..... Class .....

121/1

MATHEMATICS

MINI-MOCK EXAMINATION 2014

Paper 1

2½ Hours

Instructions to candidates

1. Write your name, admission number and class in the spaces provided above.
2. The paper contains two sections: **Section I** and **Section II**.
3. Answer **ALL** the questions in **Section I** and **ANY FIVE** questions from **Section II**.
4. All working and answers must be written on the question paper in the spaces provided below each question.
5. Marks may be awarded for correct working even if the answer is wrong.
6. Negligent and slovenly work will be penalized.
7. Non-programmable silent electronic calculators and mathematical tables are allowed for use.

For Examiner's use only

Section I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total

Section II

17	18	19	20	21	22	23	24	Total

Grand Total %

This booklet contains 17 printed pages. Please confirm that all the pages exist and are properly printed before starting the exam.

Section I (50 marks)

Answer all the questions in this section in the spaces provided

1. Without using a calculator or mathematical table, evaluate.

$$\frac{8^{2/3}+4^{3/2}}{16^{-3/4}}$$

{3 marks}

2. One interior angle of a certain polygon is 84^0. If each of the other angles is 147^0, how many sides does this polygon have? (3 marks)

3. What is the exact value of $\frac{2W(x-2)^2}{y+1}$ if x=3, y=x+3 and w=2x+y (2marks)

4. Mtalii on arrival in Kenya converted 6000 Euros into Kenya shillings. During his three day's stay he spent Ksh. 260,000. He converted the remaining amount into US dollars. How many US dollars did he get? (Use the exchange rate below)

	Buying	Selling
1 US dollar $	86.35	86.55
1 Euro	116.51	116.80

(3marks)

5. Security light poles have been erected along both sides of a street in Malava town. The poles are 50m a part along the left hand side of the road while they are 80m a part along the right hand side. At one end of the road the poles are directly opposite each other. How many poles will be erected by the time the poles are directly opposite each other at the end of the road? (3 marks)

6. Simplify completely $\frac{3x^2-1}{x^2-1}-\frac{2x+1}{x+1}$ (3marks)

7. A cylindrical iron pipe is 21m long and 12cm in external diameter, the metal is 1cm thick and its density is 7.8g/cm3. Taking pie as 3 ½, find its mass. (3 marks)

8. Given that $\sin\theta = \frac{5}{13}$, find tan (90 - θ) in its simplest form (2marks)

9. A cylinder of radius 14cm contains water. A metal solid hemisphere of radius 6.8cm is submerged into the water in the cylinder. Find the change in height of the water in the cylinder.
(4marks)

10. The angle of elevation of the top of a tower from a point X on the horizontal is 28.5°. From another point Y, 8 meters near to the base of the tower, the angle of elevation of the top of the tower is 37.2^0. Calculate, to one decimal place, the height of the tower.
(4 marks)

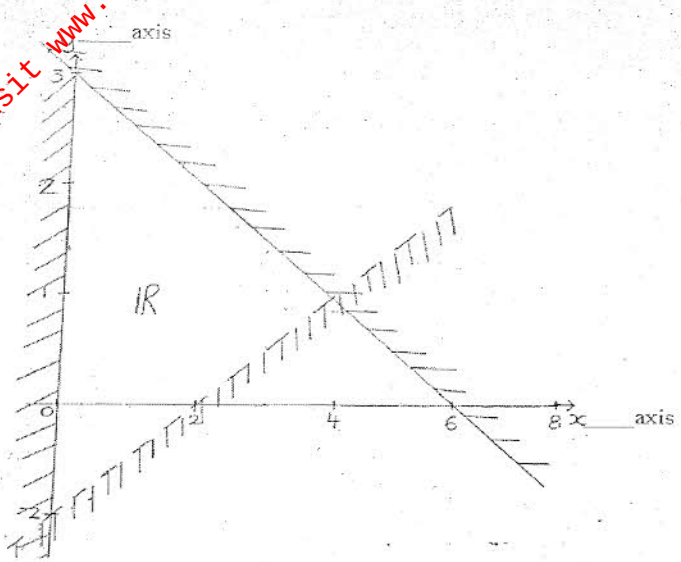
11. A two digit number is such that the difference between the ones digit and the tens digit is 2. If the two digits are interchanged, the sum of the new and the original number is 132. Find the original number. (3 marks)

12. Given that $-\frac{3}{5}x + 3y - 6 = 0$ is an equation of a straight line. Find:

(i) The gradient of the line (1mark)

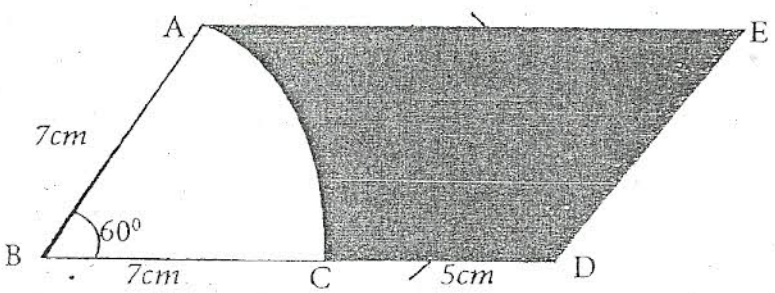
(ii) Equation of a line passing through point (2, 3) and parallel to the given line. (2marks)

13. The region R in the figure below is defined by the inequalities L1, L2 and L3.



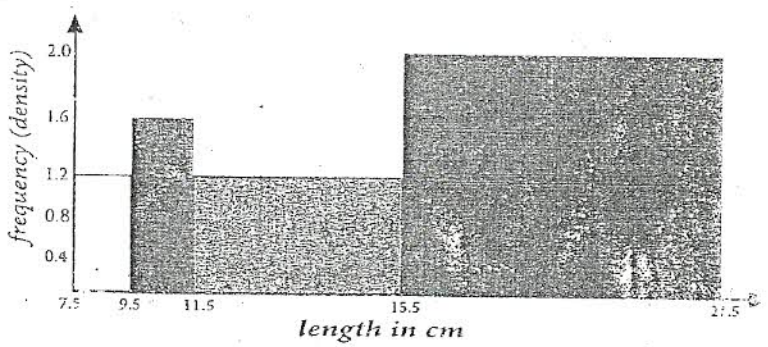
Find the three inequalities (3marks)

14. In the figure below, AC is an arc of a circle centre B, angle ABD = 60^0, AB =BC=7cm and CD=5cm. If AE is parallel to BD and AB is parallel to ED. Calculate the area of the shaded region. (3 marks)



15. The area of a rhombus is 60 cm^2. Given that one of its diagonals is 15 cm long, calculate the perimeter of the rhombus. {4 marks}

16. The figure below shows a histogram.



Complete the frequency distribution table below. (4marks)

Length x cm	Class width	Frequency density	Frequency
$7.5 \leq x < 9.5$		1.2	24
$9.5 \leq x < 11.5$			
$11.5 \leq x < 15.5$			

$15.5 \leq x < 21.5$			

SECTION II (50 MARKS)

Answer any five questions in this section

17. The distance between towns M and B is 560 km. A car and a lorry travel from M to B. The average speed of the lorry is 20 km/h less than that of the car. The lorry takes $1\frac{1}{6}$ hours more than the car to travel from M to B.

a) If the speed of lorry is x km/h, find x. (5marks)

b) The lorry left town M at 7:15 am. The car left M later and overtook the lorry at 11:15 am.

Calculate

i) the time the car left town M. (3 marks)

ii) the distance yet to be covered by the lorry as the car arrives at B. (2 marks)

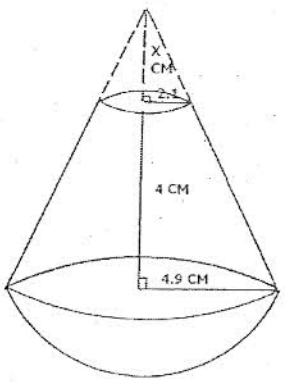
18. On some day, Mr. Makori bought some oranges worth Ksh: 45, on another day of the same week his wife, Mrs. Makori spent the same amount of money, but bought the oranges at a discount of 75 cents per orange.

(a) If Mr. Makori bought an orange at sh.x, write down a simplified expression for the total number of oranges bought by the two in the week. (3 marks)

(b) If Mrs. Makori bought 2 oranges more than her husband, find how much each spent on an orange. (5 marks)

(c) Find the number of oranges bought by the two. (2 marks)

19. The diagram below represents a solid consisting of a hemispherical bottom and a conical frustrum at the top.



a) Determine the value of x and hence the height of the cone. (2marks)

b) Calculate

(i) The surface of the solid. (4marks)

ii) The volume of the solid. (4marks)

20. A trader sold an article at sh.4800 after allowing his customer a 12% discount on the marked price of the article. In so doing he made a profit of 45%.

a) Calculate

(i) The marked price of the article. (3 marks)

(ii) The price at which the trader had bought the article (2marks)

b) If the trader had sold the same article without giving a discount. Calculate the percentage profit he would have made. (3 marks)

c) To clear his stock, the trader decided to sell the remaining articles at a loss of 12.5% calculate the price at which he sold each article. (2marks)

21. B is 102km on the bearing of 112° from A. C is 94km on the bearing of 062° from B. D is 073° from A and 336° from C.

(a) Using a scale of 1cm to represent 20km, draw a diagram to show the positions of A,B,C and D. (6marks)

b) Using your diagram, determine;

i) The bearing of B from D and A from C. (2marks)

ii) The distance AC and BD (2marks)

22.a) Find the equation of the perpendicular bisector of the line AB where A is (3,9) and B is (7,5) in the form $ax + by \pm c = 0$. (3 marks)

b) The perpendicular bisector of line AB in (a) above intersects the line joining the points (2, 4) and (-3, 1) at C. Find the

i) co-ordinates of C. (3marks)

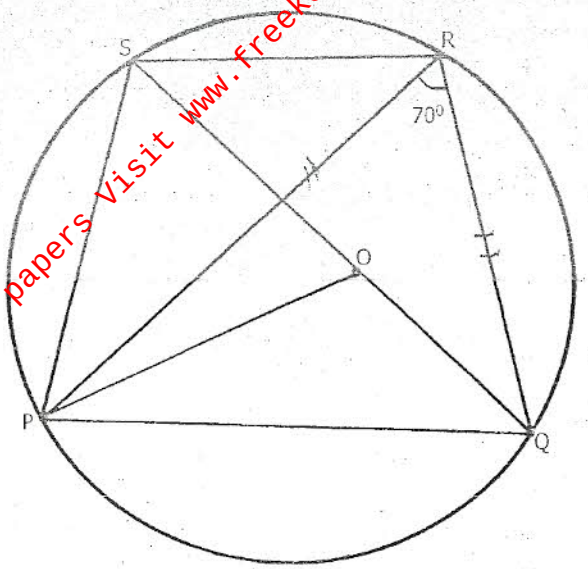
b) The area of sector BCD (3marks)

c) The length of the common CD. (2marks)

d) The area of quadrilateral ACBD (1mark)

e) The shaded area. (1mark)

24. The figure below shows a circle centre O. PQRS is a cyclic quadrilateral and QOS is a straight line.



Giving reasons for your answers, find the value of:

a) <PRS (2 marks)

b) <POQ (2 marks)

c) <RPS (2 marks)

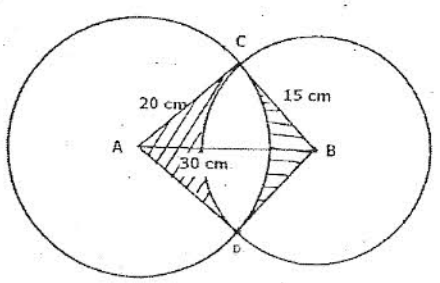
d) <PSR (2 marks)

e) Reflex <POS (2 marks)

ii) the length of C from line AB (2marks)

c) The line through (2, 4) and (-3, 1) makes an angle θ with the positive X-axis. Find the value of θ. (2marks)

23. The diagram shows two intersecting circles of radii 20 cm and 15 cm such that their centres A and B are 30 cm apart.



Calculate to 2 decimal places;

a) The area of sector ACD (3marks)