END OF TERM ONE EXAMINATION-FORM TWO-MATHEMATICS

Name: …………………………………………………….. Class: ……..…..

Date: ………………………………………………… Adm No: …………………………………..

TIME: 2 HOURS 30 MINUTES

INSTRUCTIONS TO CANDIDATES:

- Write your name, admission number, Class, Signature and write date of examination in the spaces provided
- The paper contains two sections. Section I and Section II.
- Answer ALL the questions in section I
- Answer any five questions in section II.
- Answers and working must be written on the question paper in the spaces provided below each question.
- Show all steps in your calculations below each question.
- Marks may be given for correct working even if the answer is wrong.
- KNEC mathematical table may be used, except where stated otherwise.

FOR EXAMINERS USE ONLY
SECTION I

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

SECTION II

Question	17	18	19	20	21	22	23	24	TOTAL
Marks									

GRAND TOTAL

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SECTION I (50 MARKS)

Answer all the questions from this section

1. Work out the following, giving the answer as a mixed number in its simplest form

$$\dfrac{\dfrac{2}{5} \div \dfrac{1}{2} \, of \, \dfrac{4}{9} - 1\dfrac{1}{10}}{\dfrac{1}{8} - \dfrac{1}{6} \times \dfrac{3}{8}}$$ (3marks)

2. When a certain number is divided by 30, 45, 54, there is always a remainder of 21. Find the least numbers.   (3marks)

3. Evaluate without using mathematical tables of a calculator,

$$\dfrac{0.0084 \times 1.23 \times 3.5}{2.87 \times 0.056}$$ expressing your answer as a single fraction.   (3marks)

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4. Use logarithm to solve tables to evaluate   (4 marks)

$$\sqrt[3]{\frac{45.3 \times 0.00697}{0.534}}$$

5. If each interior angle of a regular polygon is 150^0, how many sides does the polygon have?

(3 marks)

6. Solve for x in the equation

$32^{(x-3)} \div 8^{(x-4)} = 64 \div 2^x$ (3 marks)

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7. Use reciprocal table to work out.

$$\frac{7}{0.5283} + \frac{0.5}{3.735}$$

(4marks)

8. Three pens and four exercise books cost sh. 87. Two pens and five exercise books cost sh.93. Find the cost of one pen and one exercise book. (3marks)

9. A Kenyan Company received US dollars 100,000. The money was converted into Kenya Shillings in a bank which buys and sell foreign Currencies as shown below.

	Buying (kshs)	Selling (ksh)
1 US Dollar	77.25	77.44
1 sterling pound	119.93	120

a) Calculate the amount of money in ksh, the Company received. (1mark)

b) The company charged the Kenya shillings calculated above into sterling pounds to buy Car in Britain. Calculate the cost of the car to the nearest sterling pounds.

(2marks)

10. A company saleslady sold goods worth sh. 1,600,000. From this sale she earned a commission of sh. 40,000.

    a) Calculate the rate of Commission. (1mark)

    b) If she sold goods whose marked price was sh. 3 600,000 and allowed a discount of 2%, calculate the amount of commission she received. (2marks)

11. A piece of metal has a volume of 20cm^3 and a mass of 300g. Calculate the density of the metal in kg/m^3. (3marks)

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12. The area of a sector of a circle of diameter 126cm is 4158cm². Calculate the angle subtended at the centre of the circle. (Take pie = $\frac{22}{7}$) (3marks)

13. Simplify completely by factorization. (3 marks)

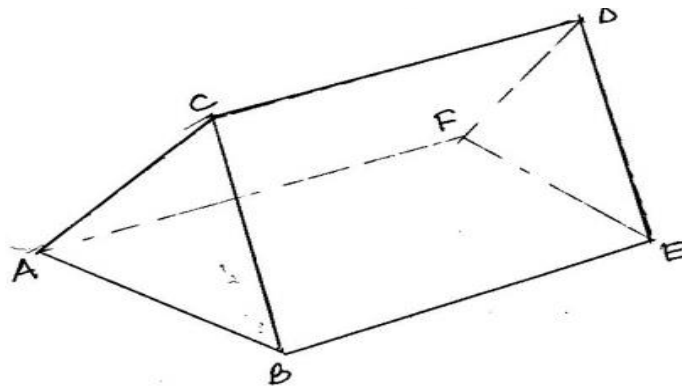$$\frac{ax + bx + ya + yb}{ma + mb + na + nb}$$

14. Evaluate: $\dfrac{-12\div(-3)\times4-(-20)}{-6\times6\div3+(-6)}$ (3 marks)

15. Use the tables of cubes to evaluate: (3 marks)

$$(3.461)^3 - \sqrt[3]{2809}$$

16. The figure below is a prism whose cross-section is an equilateral triangle such that
   AB=BC=CA=3cm, BE=CD=AF=5cm

   Draw the net of the prism   (3marks)

SECTION II (50 MARKS)
Answer five questions only from this section

17. A line L passes through point (-2,3) and (-1, 6) and is perpendicular to a line P at (-1, 6)

    a) Find the equation of L.   (3marks)

    b) Find the equation of P in the form ax + by = c.   (3marks)

    c) Given that another line Q is parallel L and passes through point (1, 2), find the x and the y intercepts of line Q.   (2marks)

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d)   Find the point of intersection of lines P and Q.   (2marks)

18. Triangle PQR has vertices at P(2,3),Q(1,2) and R(4,1), while triangle $P^1Q^1R^1$ has vertices at P^1(-2,3),Q^1(-1,2), R^1 (-4,1).

    (a)   (i)   Draw triangle PQR and $P^1Q^1R^1$ on the grid provided below   (2marks)
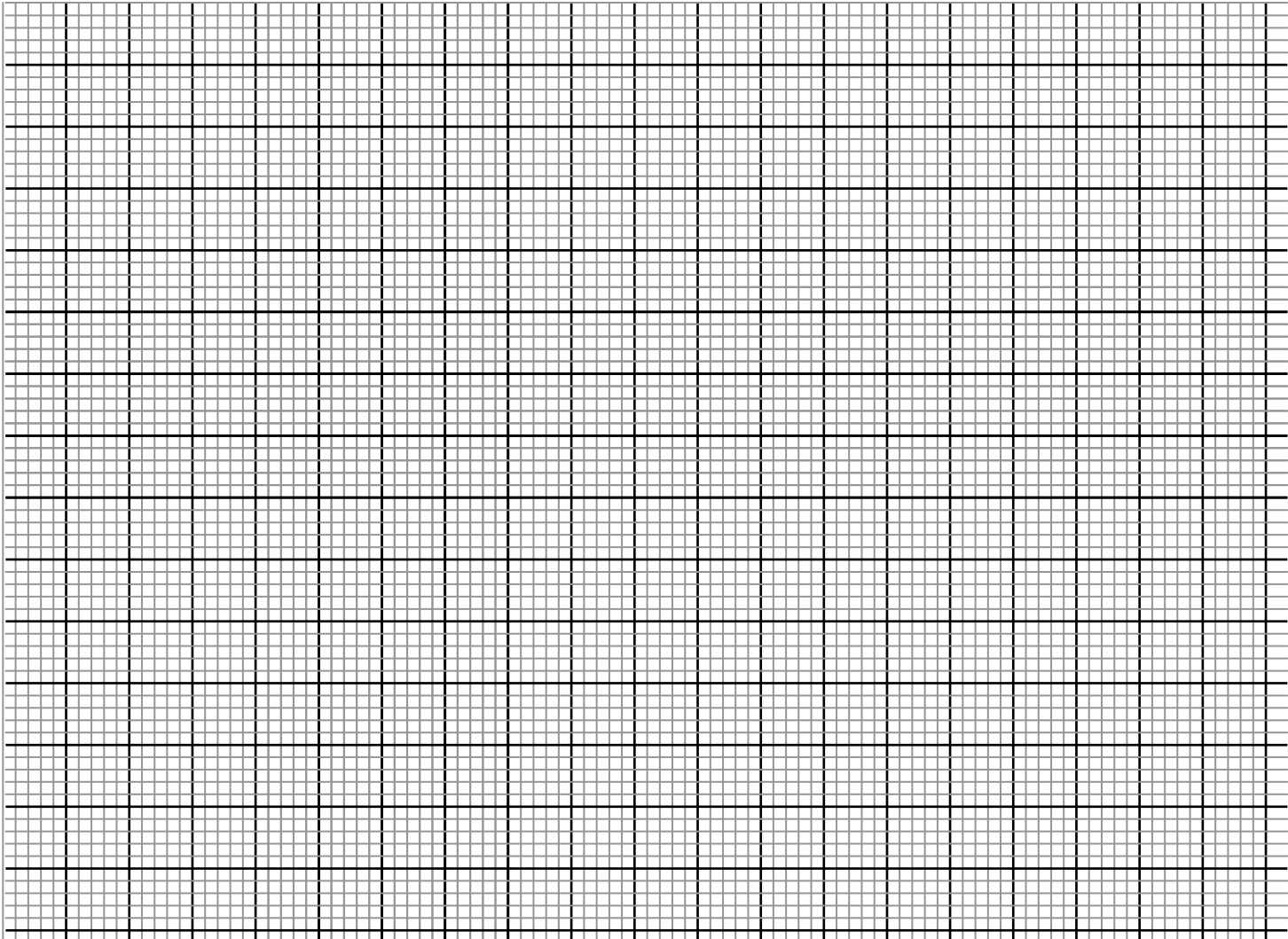
(ii) Describe fully a single transformation which maps triangle PQR onto triangle $P^1Q^1R^1$.

(1mark)

(b)   (i)   On the same plane, draw triangle $P^{11}Q^{11}R^{11}$ the image of PQR, under reflection on line y + x = 0   (2marks)

(ii)   Describe fully a single transformation which maps triangle $P^{11}Q^{11}R^{11}$ onto triangle $P^1Q^1R^1$.   (1mark)

(c)   Draw triangle $P^{111}Q^{111}R^{111}$ such that it can be mapped onto triangle PQR by a positive quarter turn about the origin   (2marks)

(d)   State all pairs of triangles that are oppositely congruent   (2marks)

19. A businessman sold a car at sh.900 000 after allowing his customer a 10% discount on the marked price of the car. In so doing he made a profit of 20%.

a) Calculate

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

(ii) The price at which the businessman had bought the car (2marks)

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

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c) In the month of December the businessman sold 20 vehicles without giving a discount. Determine the total profit he received from the sale.   (2 marks)

20. Four towns A, B, C and D are such that town B is 180 km East of A. Town C is at a distance of 120km on a bearing of 300^0 from B. Town D is due West of C and North Of A.

(a) Using a scale of 1cm to represent 20km, make an accurate scale drawing to show the relative positions of the towns.   (4 marks)

(b) Find:

(i) Determine the bearing of C from A   (1mark)

(ii) Determine the distance of C from D   (2 marks)

(iii) Determine the bearing of B from D   (1 mark)
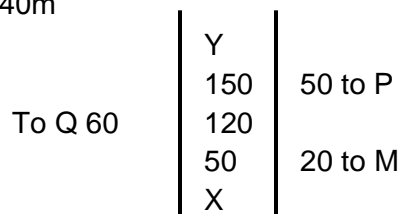
(iv) Determine the distance of A from D   (2 marks)

21. The measurements (in metres) of a field were given in a field note book as follows:

Base line XY = 240m

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                    │ Y  │
                    │150 │  50 to P
        To Q 60     │120 │
                    │ 50 │  20 to M
                    │ X  │
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(a) Using a scale of 1 cm to represent 20 m, draw an accurate map of the farm.   (4 marks)

(b) **Find** the area of the field in hectares.   (4marks)

(c) If the farm is on sale at sh. 900 000 per hectare, find how much the farm costs.   (2 marks)

22. Triangle ABC is such that AB = 7cm, angle ABC = 120^0 and angle BAC = 30^0.

   (a) Using a ruler and a pair of compass only, construct triangle ABC.   (3 marks)

   (b) Measure the length of:

   (i)   Line BC   (1 mark)

   (ii)   Line BC   (1 mark)

(c) Drop a perpendicular from C to meet line AB extended at M.   (2 marks)

(d) Measure the length of line CM   (1 mark)

(e) Calculate the area of triangle ABC   (2 marks)

23. A hollow metal pipe whose internal and external and internal diameters are 6.3cm and 2.8cm respectively is 3.5m long.

(a) Calculate the volume of the metal used to make the pipe.   (4 marks)

(b) The pipe is melted down and recast into a solid cylinder of height 1.75m. Calculate the radius of the cylinder to two decimal places.   (4 marks)

(c) Given that the density of the metal above is 4.2g/cm³, calculate the mass of the solid cylinder in kilograms. (2 marks)

24. Three business people Kamau, Gachui and Maina agreed to contribute Kshs. 1 210 000 to start a business. The ratio of Kamau's contribution to Gachui's contribution is 3 : 2 while that of Gachui to Maina is 1 : 3.

(a) Determine the ratio of Kamau's contribution to Maina's contribution. (2 marks)

(b) Determine the amount of money contributed by Kamau (2 marks)

(c) They agreed to share their profits as follows;

50% to be shared in the ratio of their contributions

40% to be retained for the running of the business

10% to be set aside for emergencies

If their total profit for the year 2014 was sh.704 000, determine the

(i)   Amount of money retained for running the business. (2 marks)

(ii)   The amount of money set aside for emergencies.   (2 marks)

(iii)   The amount of received by Gachui   (2 marks)