Name……. **Index No**……/…….

School…… **Date** ……..…

Candidate's Signature……

121/1
MATHEMATICS
PAPER1
KCSE MOCKS 2017

Time: 2 ½ Hours

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the spaces provided at the top of this page.
2. Sign an write the date of the examination
3. This paper consists of two sections: Section I and Section II
4. Answer ALL questions in section 1 and ONLY FIVE questions from section II
5. Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.
6. Marks may be given for correct working even if the answers are wrong.
7. Non – Programmable silent electronic calculators and KNEC mathematical tables may be used, except were stated otherwise.

FOR EXAMINERS 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 paper consists of 16 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing

SECTION I (50 MARKS)
Answer ALL the Questions in this section in the spaces provided

1. Simplify. (3 marks)

$$\frac{3}{5} \div \frac{2}{3} - \frac{1}{2} \times \frac{1}{13} \text{ of } \left(\frac{1}{2} + \frac{4}{5} \right)$$

2. Given that point A(2,4) and B(8, -4) , find the equation of the perpendicular bisector of line AB.

(3 marks)

3. Solve the following inequality and represent your solution on a number line. (3 marks)

$$3 + x - 4(x - 3) \leq 30$$

4. A Japanese travelling from Britain arrives in Kenya with 10,000 Euros which all was converted to Kenya shillings at he bank. While in Kenya, he spends a total of Kenya shillings 498,500 and

then converts the remaining Kshs to Japanese Yen at the bank. Use the exchange rate table below to calculate the amount in Japanese Yen that he receives.

	Buying(Kshs.)	Selling(Kshs.)
1 Euro	120.25	121.15
100 Japanese Yen	62.75	63.000

(4 marks)

5. Use a calculator to work out (3 marks)

$$\left(\frac{34^3 - 257}{97 \times 1243}\right)^{\frac{1}{4}}$$

6. Evaluate the following without using mathematical tables or calculator. (3 marks)

$$\frac{Sin30^0 Tan240^0 Cos60^0}{Cos120^0 Sin45^0}$$

7. The equation of a circle is given by $2x^2+16x+2y^2-4y-2=0$. Determine the radius and centre of the circle. (3 marks)

8. The perimeter of a triangular field is 120 M. Two of the sides are 21m and 40m. calculate the largest angle of the field hence find the area of the field. (3 marks)

9. Use the reciprocal tables, square tables and cube tables to evaluate; (3 marks)

$$\frac{5}{(26.52)^2} - \frac{3}{(0.00482)^{\frac{1}{2}} + 2.734^3}$$

10. The ratio of the fourth to the first term of a G.P is $\frac{1}{8}$. If the first term exceeds the second term by 5, find the first and the 8^{th} terms of the sequence. (3 marks)

11. The total marks scored in a test by 6 pupils was 420. If the mean mark for the first 5 pupils was 68 find the marks scored by the sixth pupil. (3 marks)

12. Solve the following simultaneous equations using Matix Method. (3 marks)

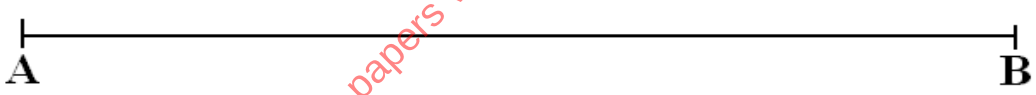
4a+3b=120

2a+5b=130

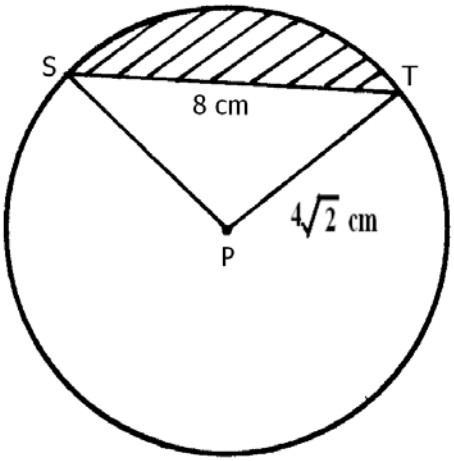
13. A triangle PQR has a height of x cm and a base of(x+3) cm. if its area is 5 cm^2, calculate the height of its base. (3 marks)

14. Using a set square, a ruler and a pair of compasses, divide the given line into five equal parts

(3 marks)



15. The figure below sows a circle with centre P and radius $4\sqrt{2}$ cm. if the length of the chord ST is 8 cm, show that the shaded area is $(8\pi-16)$ cm^2. (3 marks)



16. A self help group of 10 young men invested Shs 72,000 in two companies A and B. A pays a dividend of 22.5% while B pays a dividend of 21%. If from their total investment they obtained a return of 21.5%, how much money did they invest in each company? (4 marks)

SECTION II (50 MARKS)

Answer ANY FIVE questions from this section in the spaces provided

17. a) Use the trapezium rule with 5 strips to estimate the are enclosed by the curve, the x-axis and the lines x=-2 and x=3 of the curve $y=x^2+x+9$ (4 marks)

b) Find the exact area bounded by the curve, the x-axis and the line x=-2 and x=3.(4 marks)

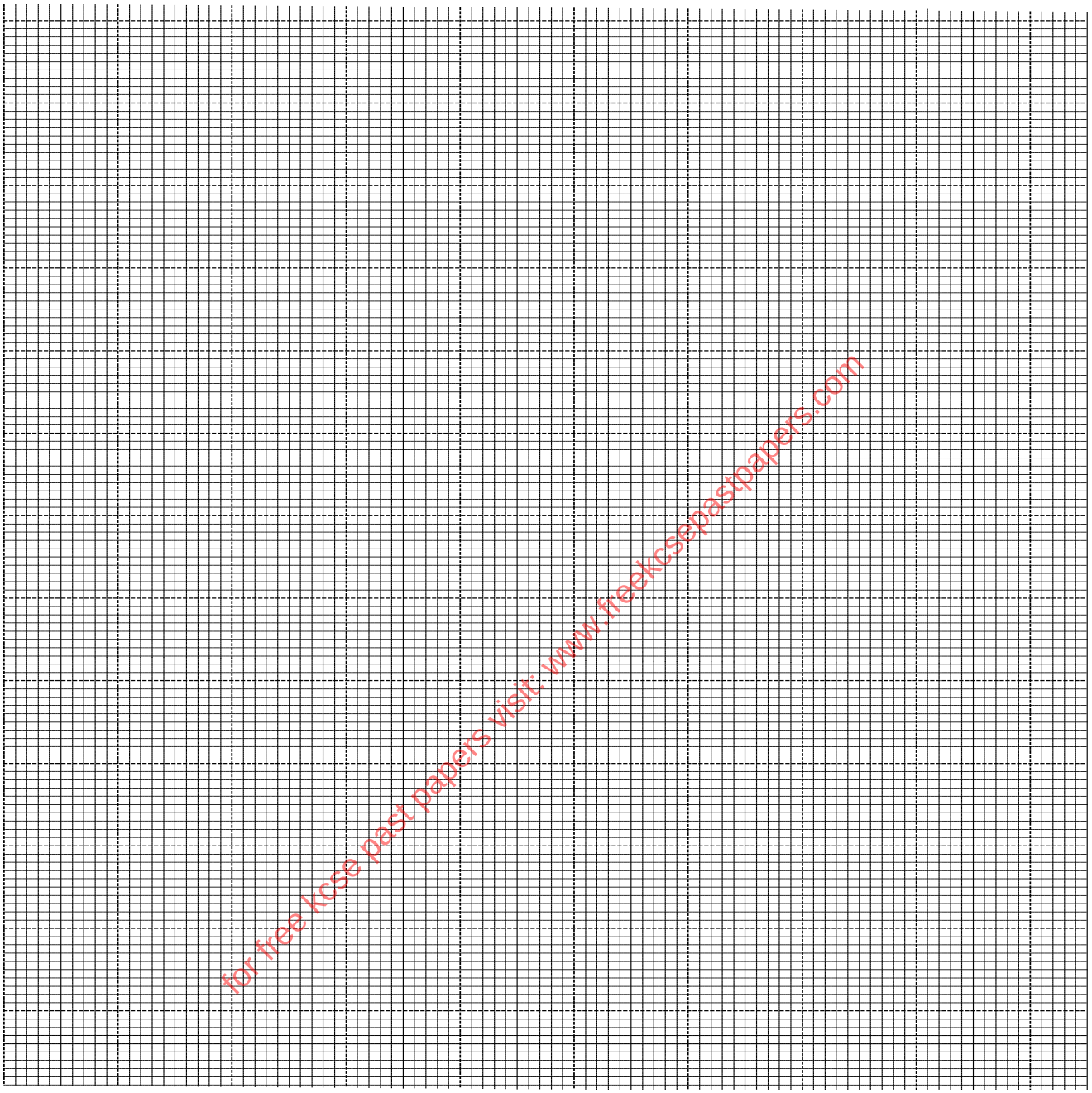
c) Find the percentage error in your workings. (2 marks)

18. Two quantities A and B are related by the equation $A=KB^n$. the table below shows the corresponding values of A and B from the relation.

A	1.2	1.5	2.0	2.5	3.5	4.5
B	1.57	2.26	3.39	4.73	7.87	11.5

a) Determine a linear equation connecting A and B. (1 mark)

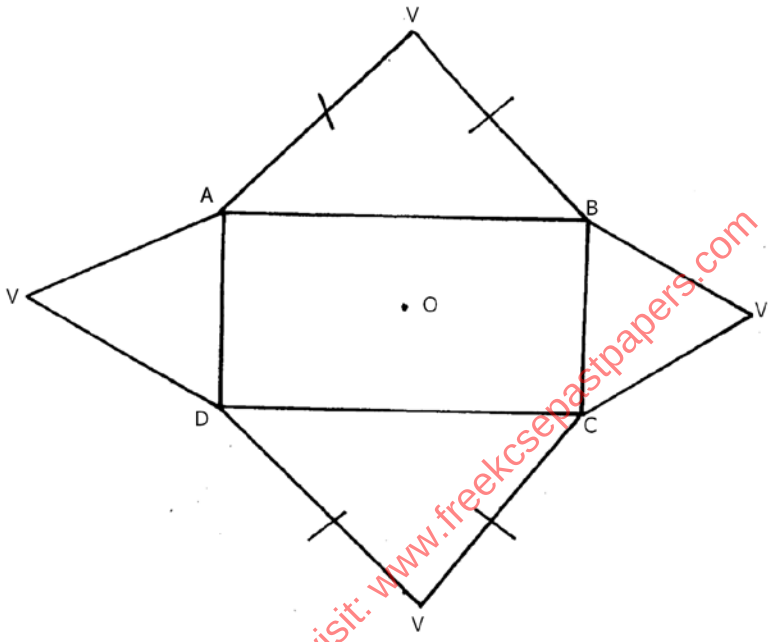
b) Draw a suitable straight line graph to represent the relationship above. (5 marks)



c) Use your graph to estimate the values of K and n (3 marks)

b) Write down the equation connecting A and B. (1 mark)

19. The figure below shows the net of a regular rectangular based pyramid. The rectangle measures 18 cm by 15 cm. N and K are mid-points of AD and BC respectively. AB=18 cm and BC= 15 cm while VK=16 cm. V is the vertex and O is the centre of the rectangle ABCD.



a) Sketch the pyramid and label all the vertices (1 mark)

b) From the diagram in (a) above, calculate to 2 decimal places.

i) Length CV (2 marks)

ii) Length VO (2 marks)

iii) The angle between the plane VCB and the base ABCD. (2 marks)

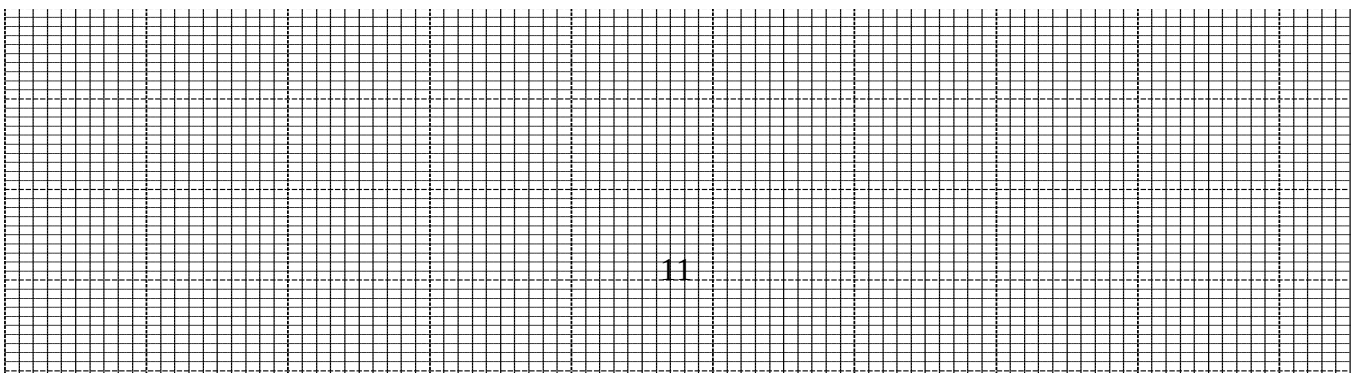
iv) The angle between the plane BVC and AVD (3 marks)

20. Draw triangle ABC with A(3,4), B(1,3) and C(2,1)

a) Draw $\Delta A^{I}B^{I}C^{I}$, the image of ΔABC under a rotation of $+90^{0}$ about (O,O) (2 marks)

b) Draw $\Delta A^{II}B^{II}C^{II}$, the image of $\Delta A^{I}B^{I}C^{I}$ under a reflection in the line y=x. (2 marks)

c) Draw $\Delta A^{III}B^{III}C^{III}$, the image of $\Delta A^{II}B^{II}C^{II}$ under a rotation of $+90^{0}$ about (O,O)(2 marks)



d) Describe a single transformation that maps ΔABC onto $\Delta A^{III}B^{III}C^{III}$. (2 marks)

e) State the type of congruence between the object and the final image. (2 marks)

21. An employee earns a basic salary of Ksh. 19,630 and a house allowance of Ksh. 6,200 per month. He claims a relief of Ksh 1080 per month, and is paid a transport allowance. The income taxation table used was shown.

Monthly income(K£)	Rate per K£(Shs)
1-480	2
481-960	3
961-1440	5
1441-1920	7
1921-above	9

a) If he paid a PAYE of sh 3233 per month, calculate his transport allowance (5 marks)

b) If he pays shs 320 to NHIF, sh 500 to Co-op loan and shs 2,500 to Co-op shares, find his net monthly salary. (3 marks)

c) He decide to save $\frac{1}{6}$ of his basic salary to purchase a Motor bike. Calculate his saving per year. (2 marks)

22. A motorist is to follow the route ABCD. B is 250 km from A on a bearing of N75^{0}E from A. C is on a bearing of S75^{0}E from A and 275 km from B. D is 300 m on a bearing of S80^{0}E from B. Using a scale of 1 cm to represent 50 km;

a) Show the relative position of ABCD. (6 marks)

b) Determine:

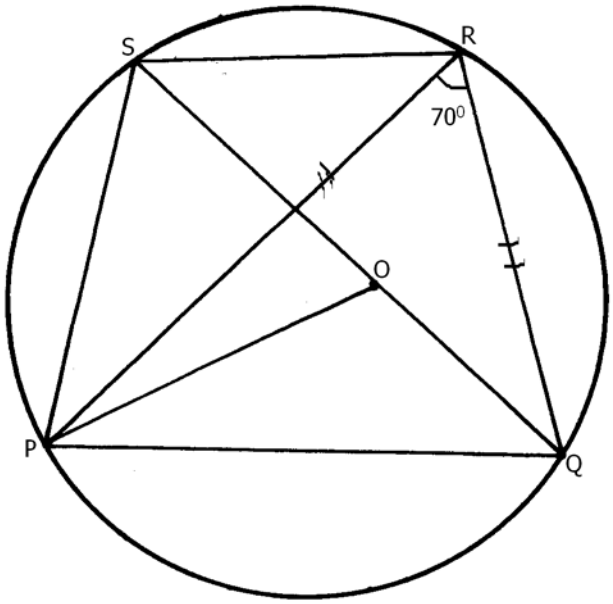
i) The distance of A from C (1 mark)

ii) The bearing of B from C (1 mark)

iii) The distance of A from D (1 mark)

iv) The compass bearing of C from D (1 mark)

23. 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)

24. A matatu left town A at 7.00 a.m and travelled towards a town B at an average speed of 60km/h. A second matatu left town BB at 8.00 a.m and travelled towards town A at an average 60 km/h. If the distance between the two towns is 400 km, find:

a) The time at which the two matatus met. (5 marks)

b) The distance of the meeting point from town A. (5 marks)

END