

NAME..... ADM NO.....  
SCHOOL..... CANDIDATES SIGN.....  
DATE .....

121/1  
MATHEMATICS  
FORM 2  
END OF TERM THREE  
TIME: 2 ½ HOURS

**END OF TERM (III) EXAMINATION -2019**  
*Kenya Certificate of Secondary Education (K.C.S.E)*

121/1  
MATHEMATICS  
FORM 2  
END OF TERM THREE  
TIME: 2 ½ HOURS

**INSTRUCTIONS TO THE CANDIDATES**

- Write your name, Admission number, class and name of your school in the spaces provided.
- Answer all questions



**SECTION I (50MKS)**

*Answer all the questions in this section*

1. Evaluate

(3mks)

$$\frac{44 - (-28)}{(12) - (2)} - \frac{(8^2)(-12) - (24)}{96 \div (-12) \times (9)}$$

2. Given that  $P = -4$ ,  $n = 6$  and  $r = -2$  find the value of:

(3mks)

$$\frac{P^2(n-r^2)}{nr}$$

3. Use logarithm tables only, evaluate

(4mks)

$$\frac{\sqrt{449.6 \times 3.21}}{2941}$$

4. Jacob a student at Uhuru mixed secondary bought 5 pens and 3 exercise books from Jufa supermarket at Kshs. 135, at the same time Joel, his classmate, also bought 4 pens and 5 exercise books and spent Kshs. 25 more than Jacob. Find the cost of each pen and exercise book (3mks)



5. Given that  $\sin 2x = \cos 2x - 30$ . Find the value of  $\tan x$

(3mks)

6. Solve for  $x$  given that  $3^{2x+3} + 1 = 28$

(3mks)

7. Find all the integral values of  $x$  which satisfy the simultaneous inequalities

$$x + 8 > 4x - 6 \geq 3(4 - x)$$

(3mks)

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8. Using a ruler and pair of compasses only, construct a quadrilateral ABCD in which  $AB = 4\text{cm}$ ,  $BC = 6\text{cm}$ ,  $AD = 3\text{cm}$ ,  $\angle ABC = 135^\circ$  and  $\angle DAB = 60^\circ$ . Measure the size of angle BCD

(4mks)

9. A car left Meru for Embu a distance of 100km at an average speed of 60km/h at 8.00am. At 8.30am a bus left Embu for Meru at an average speed of 40km/h. At what time did they meet.

(3mks)

10. A cylindrical pipe 5 metres long has an internal diameter 28 millimetres and an external diameter of 42 millimeters. The density of the material that makes the pipe is  $1.45 \text{ g/cm}^3$ . Calculate the mass of the pipe in kilograms. (take  $\pi = \frac{22}{7}$ )

(4mks)



11. Use factor method to simplify the following

(2mks)

$$\sqrt[3]{27x^3y^9}$$

12. Ruto is  $2\frac{1}{4}$  times as old as his son. Five years ago, the ratio of their ages was 8:3. What will be the their ages 6 years from now? (3mks)

13. Express the recurring decimal  $3.2\overline{56}$  as a fraction in its simplest form

(3mks)

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14. A Kenyan Bank buys and sells foreign currencies as shown below

	Buy (Kshs.)	Sell (Kshs.)
1 Euro	84.15	84.26
50 Japanese Yen	65.37	65.45

A Japanese traveling from France arrives in Kenya with 5000 Euros. He converts all the 5000 Euros to Kenya shillings at the bank. While in Kenya he spends a total of Kshs. 289,850 and then converts the remaining Kshs. To Japanese Yen at the bank. Calculate the amount in Japanese Yen that he receives. (3mks)

15. Given  $\underline{a} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$  and  $\underline{b} = \begin{pmatrix} -7 \\ 4 \end{pmatrix}$

Determine  $2\underline{a} + \underline{b}$  hence  $|2\underline{a} + \underline{b}|$  correct to 3 decimal places. (3mks)

16. 32 men working at the rate of 9hrs a day can complete a piece of work in 7 days. How many more men working at the rate of 8hrs a day would complete the same work in 6 days? (3mks)



SECTION II (50 MARKS)

Answer all the questions in this section

17. Two points P and Q are P(3, -2) and Q (5, 10)

a) Determine the gradient of the line PQ

(2mks)

b) Find the equation of the line through the points P and Q in the form  $y = mx + c$

(3mks)

c) Find the coordinates of point M the midpoint of PQ

(2mks)

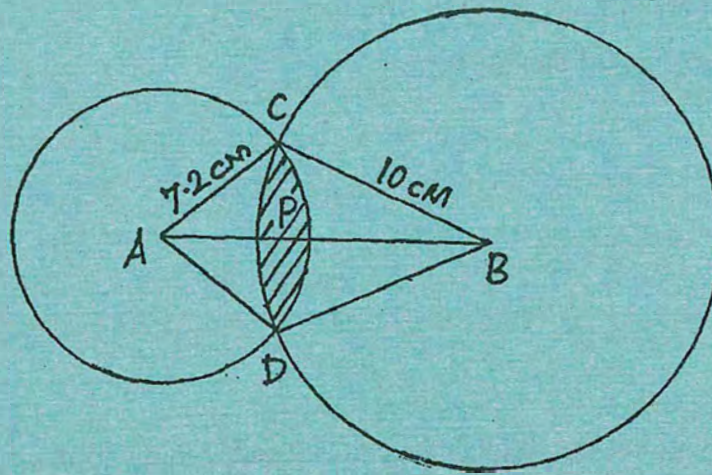
d) Another line passes through point M and perpendicular to PQ. Find its equation in the form  $y = mx + c$

(3mks)

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18. The figure below shows the circles with centres A and B and of radii 7.2cm and 10cm respectively. Centres A and B are 12cm apart and  $AP:PB=1:2$



Calculate to four significant figures the:

a) Size of angle CAD

(2mks)

b) Size of angle CBD

(2mks)

c) Area of the shaded region (Take  $\pi = 3.142$ )

(6mks)



19. The boundaries AB, BC, CD and DA of a ranch are straight lines such that B is 16km on a bearing of  $040^{\circ}$  from A. C is directly South of B and East of A and D is 12km on a bearing of  $120^{\circ}$  from C.

a) Using a scale of 1cm to represent 2km, show the above information in a scale drawing (3mks)

b). From the scale drawing, determine

(i) The distance in km of A from D

(2mks)

(ii) The bearing of A and D

(2mks)

(iii) Calculate the area of the ranch ABCD in square kilometers

(3mks)

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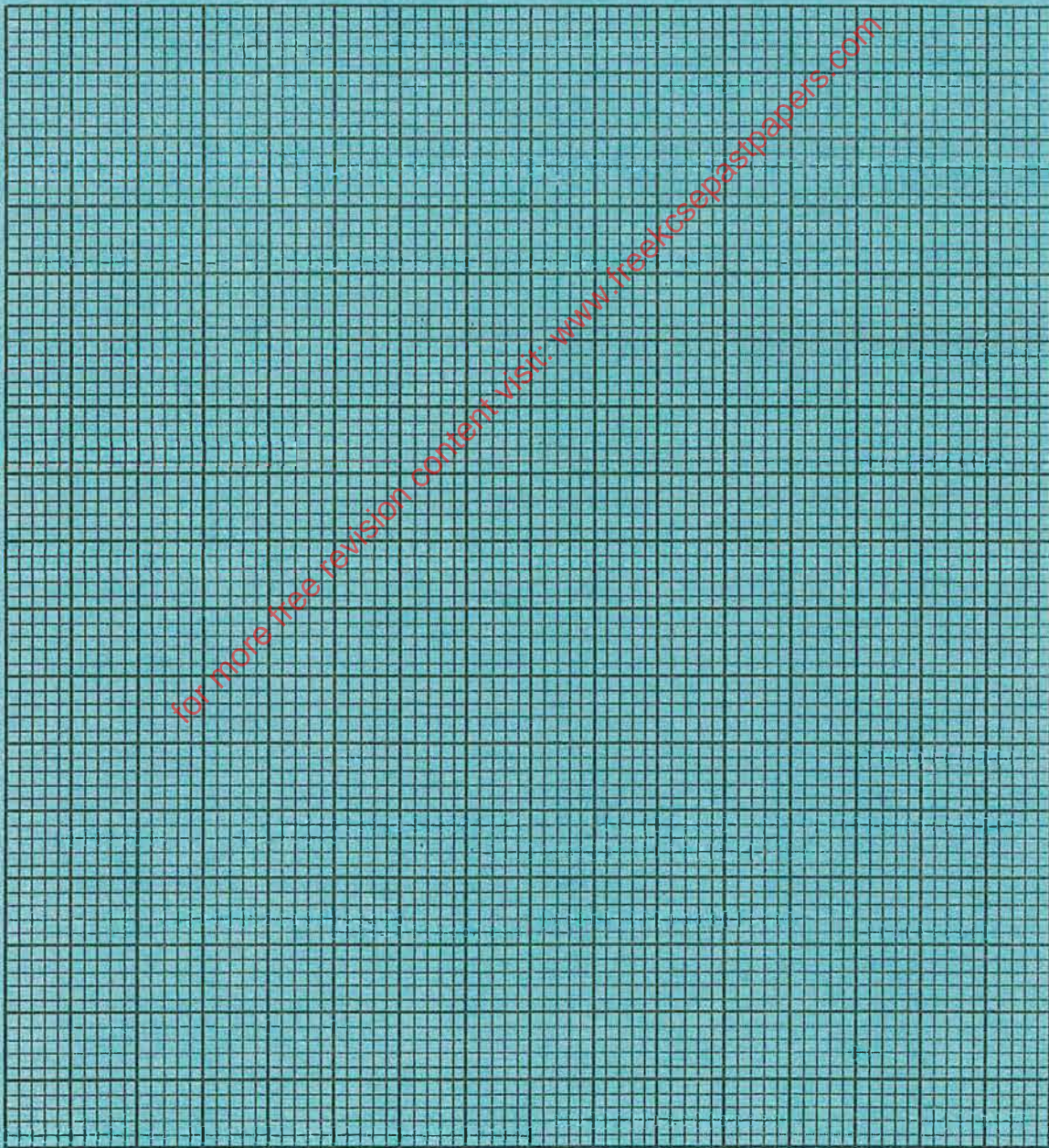
20. ABC is a triangle such that A (3, 3) B (6, 6) and C (6, 3).  $A^1$  (-3,3)  $B^1$ (-6,6) and  $C^1$  (-3,6) is the image of ABC

a) Draw both triangles ABC and  $A^1B^1C^1$  on the grid provided (2mks)

b) Describe a single transformation which maps ABC onto  $A^1B^1C^1$  (3mks)

c)  $A^{11}B^{11}C^{11}$  is the image of  $A^1B^1C^1$  under a translation vector  $T = \begin{pmatrix} -2 \\ 1 \end{pmatrix}$ . Draw  $A^{11}B^{11}C^{11}$  and state its coordinates (3mks)

d) Find  $A^{111}B^{111}C^{111}$  the image of  $A^{11}B^{11}C^{11}$  under an enlargement scale factor -1 centre (-2, 1) and state the coordinates (2mks)





21. The table below shows the marks obtained in a math test

Marks	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84
No. of students	5	5	7	6	13	3	5	3	3

a) State the modal class

(2mks)

b) Calculate the mean

(4mks)

c) Calculate the median

(4mks)

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