KUOYO KOCHIA BOYS' HIGH SCHOOL

FORM TWO

MATHEMATICS- MARKING SCHEME

NAME _____ADM NO_____ Stream_____ DATE_____

121

MATHEMATICS
Term 2 2025
TIME: $2^{1}/_{2}$ HOURS

MID-TERM TWO EXAMINATIONS 2025

INSTRUCTIONS TO THE CANDIDATES

*a) Write **your name** and **stream** and **Admission number** in the spaces provided above*

*b) This paper contains **two** sections; **Section I** and **Section II**.*
c)** Answer **all** the questions in **section I** and **ALL** questions from **Section II
d) Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.
e) Marks may be given for correct working even if the answer is wrong.
*f) Non-Programmable silent calculators and **KNEC** Mathematical tables may be used **EXCEPT** where stated otherwise.*

FOR EXAMINERS'S 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	18	19	20	21	Total
Marks							

GRAND TOTAL

This paper consists of 12 printed pages. Candidates should check carefully to ascertain that all the pages are printed as indicated and no questions are missing.

SECTION I [50 MARKS]

(Answer All Questions in this section)

1. The GCD of two numbers is 17 and their LCM is 140. If one of the numbers is 20, find the other number. (3 marks)

$\frac{LCM \times GCD}{1st\ number}$ $\frac{17 \times 140}{20}$ $= 119$	B2 A1

2. Evaluate without using tables or calculators; (3 marks)

$$\frac{-8 \div 2 + 12 \times 9 - 4 \times 6}{56 \div 7 \times 2}$$

Numerator	Denominator		
$-8 \div 2 + 12 \times 9 - 4 \times 6$ $-4 + 108 - 24$ 80	$56 \div 7 \times 2$ 8×2 16	$\frac{80}{16}$ 5	M1 for correct numerator solution M1 for correct denominator solution A1 for correct final answer

3. Use the elimination method to solve the simultaneous equations (3 marks)

$3x - 2y = 8$
$2x + 3y = 1$

$\begin{bmatrix} 3x - 2y = 8 \\ 2x + 3y = 1 \end{bmatrix}_{\times 3}^{\times 2}$ $6x - 4y = 16$ .... i - $6x + 9y = 3$ …. ii ——————— -13y = 13 $y = -1$	$3x - 2(-1) = 8$ $3x + 2 = 8$ $3x = 6$ $x = 2$ $x = 2\ and\ y = -1$	M1 for eliminating M1 for substituting to solve next variable A1 for stating final values of x and y

4. The sum of interior angles of a regular polygon is $1080^{o,}$ Find the size of each exterior angle. (3 marks)

$180(n-2) = 1080$ $180n - 360 = 1080$ $180n = 1440$ $n = 8\ sides$ $Size\ of\ exterior = \frac{360}{8}$ $Exterior\ angle = 45^{o}$.	M1 for equating $180(n-2) = 1080$ M1 for finding correct n A1 correct size of exterior angle

5. A trader sold a wrist watch for sh. 3,150 after giving a 10% discount. Find the marked price of the watch. (2 marks)

$90\% = 3150$ $100\% = \frac{100 \times 3150}{90}$ $= sh.3500$	M1 correct equation of 100% A1 for correct marked price

6. The ratio of the radii of two spheres is 2:3. Calculate the volume of the first sphere if the volume of the second is $20cm^3$. (3mks)

$L.S.F = \frac{2}{3}$ $V.S.F = \left(\frac{2}{3}\right)^3 = \frac{8}{27}$ $v = \frac{20 \times 8}{27}$ $= 5.926cm^3$	M1 for V.S.F M1 for correct equation of v A1 correct volume

7. Maina spent one eighth of his May salary on farming, half on school fees and two thirds of the remainder on food. If he spent sh. 3200 on food. Calculate;
   a) His May salary. (3 marks)

Farming = $\frac{1}{8}$ Fees = $\frac{1}{2}$ Remainder = $1 - \frac{5}{8} = \frac{3}{8}$ Food = $\frac{2}{3} \times \frac{3}{8} = \frac{1}{4}$ Total February Salary = $\frac{4 \times 3200}{1}$ $Sh.12800$	M1 for finding the fraction remainder M1 for finding fraction on food A1 for total February salary

b) The amount he spent on school fees. (1 marks)

School Fees = $\frac{1}{2}\times$ 12800 $Sh.6400$	B1

8. Use logarithm tables to evaluate: (4 marks)

$$\sqrt{\frac{3.45 \times 16.7}{31.5}}$$

Number	Standard form	log	
3.45	3.45×10^0	0.5378	M1 finding correct logs of the numerator
16.7	1.67×10^1	+ 1.2227	
	Sum of logs	**1.7605**	M1 Finding correct log of denominator
31.5	*3.15*$\times 10^1$	- **1.4983**	
	Difference of logs	**0.2622**	
	$\mathbf{0.2622 \times \frac{1}{2}}$		B1 dividing result by 2
0.1311			
Finding antilogarithm.	1.352×10^0		A1 correct answer
	1.352		

9. a) The length of a rectangle is three times its width. If its perimeter is 24cm what is the length of the rectangle. (2 marks)

$3x$  x Let the width be x $24 = 2(x + 3x)$ $x = 3cm$ $Length = (3 \times 3)$ $=9cm$	M1 for correct perimeter equation A1 for the correct length (check units)

b) Find the Area of the rectangle. (2 marks)

$A = l \times w$ 9×3 $=27cm^2$	M1 A1 (check units- cm^2

10.

a) Evaluate 540396-726450÷3 (2 marks)

$540396 - 726450 \div 3$ $540396 - 242150$ $= 298246$	M1 A1

b) Write the total value of the digit in thousands place of the results in (a) above. (1 mark)

8000	A1

11. Solve for x in of the following equation. (3 marks)

$$3^{(2x-5)} = 27$$

$3^{(2x-5)} = 27$ $3^{(2x-5)} = 3^3$ $2x = 8$ $x = 4$	M1 for expressing 27 to base of 3 M1 for equating the powers A1 for correct value of x

12. Given that $4.\dot{3}\dot{5} = 4\frac{a}{b}$, find the a and b. (3 marks)

$r = 4.35353535$ ……i $10r = 43.5353535$ ……. ii $100r = 453.353535$ …. iii Subtracting (i) from (iii) Gives $99r = 431$ $r = \frac{431}{99} = 4\frac{35}{99}$ $a = 35$ $b = 99$	M1 for expression in terms of r M1 for finding the value of r A1 for correct values of a *and* b

13. A bank in Kenya buys and sells foreign currencies as follows.

Currency	**Buying(Ksh)**	**Selling(Kshs)**
1Sterling pound	134.20	134.65
1US dollar	71.40	71.84

A tourist arrived in Kenya with 4500 US dollars. He converted all the dollars to Kenya shillings at the bank. While in Kenya he spent Ksh. 215,000 and then converted the remaining amount to sterling pounds in the same bank. Calculate the total amount he received to the nearest sterling pound. (3 marks)

Convert USD into Ksh $4500 \times 71.40 = ksh\ 321{,}300$ Remaining Amount in Ksh After spending $(321300 - 215000) = ksh\ 106{,}300$ Amount in sterling pounds = $\frac{106300}{134.65}$ $\approx 789\ sterling\ pounds$	M1 for converting USD into KSh M1 for getting reaming amount in KSh A1 for getting remaining amount to the nearest sterling pounds.

14. The length of an arc of a circle is $8.8cm$. If the arc subtends an angle 144° at the centre, calculate the radius of the circle (Take $\pi = \frac{22}{7}$) (3 marks)

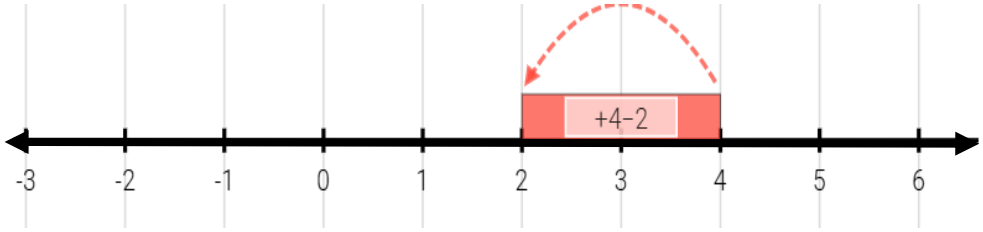
Length of arc = $\frac{\theta}{360} 2\pi r$ $8.8 = \frac{144}{360} \times 2 \times \frac{22}{7} \times r$ $8.8 = \frac{6336}{2520} r$ $r = \frac{2520 \times 8.8}{6336}$ $r = 3.5\ cm$	M1 for equating 8.8 to the formula expression M1 for making r the subject and evaluating interms of r A1 for correct value of r (check units)

15. Three years ago Maureen was three times as old as Branice. In two years time the sum of their ages will be 62. Determine the **sum** of their present ages. (4 marks)

Let Maureen's present age be x <table><tr><td></td><td>Ago</td><td>Present</td><td>Future</td></tr><tr><td>Maureen</td><td>$3(x-3)$</td><td>$3x-6$</td><td>$3x-4$</td></tr><tr><td>Branice</td><td>$x-3$</td><td>x</td><td>$x+2$</td></tr></table>$3x-4+x+2=62$ $4x=64$ $x=16$ Sum of present ages: $(42+16)=58$	M1 for expressing the ages in terms of x M1 finding the sum of ages in terms of x M1 finding the correct value of x A1 for finding correct sum of ages in two years' time

16. Show how the following operation can be performed using a number line and give the results. (2 marks)

$+4-2$

 Result = 2	M1 for correct number line A1 for correct result , accept 2 *or* $+2$

SECTION II [50 MARKS]

(Answer all questions in this section)

17. A straight line passes through points $P(5,-4)$ and $Q(-1,-2)$.

a) Find the gradient of line PQ (2 marks)

$P(5,-4)$ and $Q(-1,-2)$. $m=\frac{-4--2}{5--1}=\frac{-4+2}{5+1}$ $m=-\frac{1}{3}$	M1 for correct gradient equation A1 for gradient

b) Find the equation of line PQ inform of $y=mx+c$. (2 marks)

$-\frac{1}{3}=\frac{y+4}{x-5}$	M1 for forming the equation using gradient and correct points

$3y + 12 = -x + 15$ $3y = -x + 5 - 12$ $y = -\frac{1}{3}x - 7$	A1 for correct equation in form of $y = mx + c$

c) The equation of a line is $-\frac{3}{5}x + 3y = 6$. Find the:

i. Gradient of the line (1 mark)

$3y = \frac{3}{5}x + 6$ $y = \frac{1}{5}x + 2$ $m = \frac{1}{5}$	A1 for finding correct gradient

ii. Equation of the line passing through point $(1,2)$ and perpendicular to the given line. (3 marks)

For perpendicular lines; $m1m2 = -1$ $\frac{1}{5}m2 = -1$ $m2 = -5$ $-5 = \frac{y-2}{x-1}$ $y - 2 = -5x + 5$ $y = -5x + 7$	M1 for finding $m2$ M1 for correct use of $m2$ to find the equation A1 for correct equation

d) Find the equation of a line parallel to the line $x + 2y = 4$ and passes through point $(2,1)$.(2 marks)

$y = -\frac{1}{2}x + 2$ $m1 = -\frac{1}{2}$ $-\frac{1}{2} = \frac{y-1}{x-2}$ $2y - 2 = -x + 2$ $2y = -x + 4$ $y = -\frac{1}{2}x + 2$	M1 for using the for correct gradient to form equation A1 for correct equation

18.

a) Given that $sin\ \theta = \frac{2}{3}$ and θ is an acute angle find the value of $tan\ \theta$ (2 marks)

If $sin\ \theta = \frac{2}{3}$ In a right angled triangle; $H = 2$ $B = \sqrt{5}$ $Hy = 3$ Therefore $tan\ \theta = \frac{2}{\sqrt{5}}$	M1 for finding correct B by Pythagoras theorem A1 for finding $tan\ \theta$

b) Solve for the acute angle x, given that ; (3 marks)

$$\sin(2x - 15) = \cos 3x$$

For complementary angles $sin\ \theta = cos\ (90\ -\ \theta)$ Therefore $(2x - 15) + 3x = 90$ $5x = 105$ $x = 21^o$	M1 for summing up and equating to 90 M1 simplifying A1 finding x

c) A ladder leans against a wall so that its foot is $2.5m$ away from the foot of the wall and its top is $4m$ up the wall. Calculate the angle it makes with the ground (3 marks)

$Opp = 4\ m$ $Adj = 2.5\ m$ $\tan\theta = \frac{4}{2.5}$ $\theta = tan^{-1}\frac{4}{2.5}$ $\theta = 59.99^o$	M1 for correct application of tan M1 for introducing tan^{-1} correctly A1 for correct value of θ

d) Solve for x in the following equations

$$\frac{x+4}{5} + \frac{x+3}{5} = 6$$ (2 marks)

Multiplication across by LCM to find $x + 4 + x + 3 = 6$ $2x + 7 = 30$ $2x = 23$ $x = 11.5 = 11\,{}^{1}/_{2}$	M1 for getting the linear equation A1 for correct value of x

19. Mr. Kinyua spent $^{1}/_{4}$ of his net January salary on school fees. He spent $^{1}/_{4}$ of the remainder on electricity and water bills. He spent $^{1}/_{9}$ of what remained on transport. If he finally had

$sh.\,3{,}400$, calculate

a) His net January salary. (4 marks)

Fees $= {}^{1}/_{4}$ Electricity : ${}^{1}/_{4}\left(1 - {}^{1}/_{4}\right) = {}^{3}/_{16}$ Remainder = 1- $({}^{1}/_{4} + {}^{3}/_{16}) = {}^{9}/_{16}$ Transport = $[{}^{1}/_{9} \times {}^{9}/_{16}] = {}^{1}/_{16}$ Total used = $({}^{1}/_{16} + {}^{3}/_{16} + {}^{1}/_{4}) = {}^{1}/_{2}$ Remainder $1 - {}^{1}/_{2} = {}^{1}/_{2}$ Net salary = $\frac{3400\times2}{1}$ Sh. 6800	

b) Money spent on school fees. (2 mark)

Fees = ${}^{1}/_{4} \times 6800$ $= sh.\,1700$	

c) The amount he spent on transport. (2 marks)

Transport = ${}^{1}/_{16} \times 6800$ $= sh.\,425$	

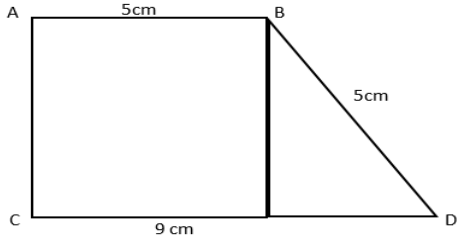
d) The amount he spent on electricity and water bills. (2 marks)

Electricity and water bills $= {}^{3}/_{16} \times 6800$ $= sh.\,1275$	

20. a) A traditional stool has a triangular top which measures 27 cm, 35 cm and 42 cm. Calculate the area of its top. (2marks)

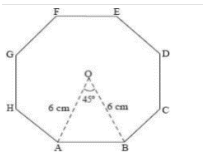
$S = \frac{27+35+42}{2} = 52$ Area = $\sqrt{52(52-27)(52-35)(52-42)}$ Area = 470.11 cm^2	M1 correct formula application A1 correct Area; check units - cm^2

b) Find the area of the figure below, given that $AB = 5cm, CD = 9cm$ and $BD = 5\ cm$ and angle $ACD = 90°$ (3 marks)



Finding height H= $\sqrt{5^2 - 4^2}$ H= 3 cm Area of trapezium A= $\frac{1}{2}(9+5) \times 3$ A= $21cm^2$	M1 for Finding Height H M1 for correct formula application A1 correct Area; check units - cm^2

c) i. The figure below shows a regular octagon ABCDEFGH, with its O as its center. If OA is 6 cm, find its area. (3 marks)



Area = $\frac{1}{2}(6 \times 6 \times \sin 45)$ = 12.7279 Total area = (12.7279×8)cm^2 A= $101.82cm^2$	M1 finding area of 1 triangle M1 multiplying by number of triangles A1 correct Area; check units - cm^2

ii) Find the length of AB in the figure above. (2marks)

$\sin 22.5 = \frac{l}{6}$ $l = 6\ sin\ 22.5$ = 2.296 cm AB = $(2.296 \times 2)cm$ = 4.592 cm	M1 for applying sin A1 correct length of AB

21.

a) Akinyi, Bundi, Cura and Diba invested some money in a business in the ratio of $7:9:10:14$ respectively. The business realized a profit of $sh.46{,}800$. They shared 12% of the profit equally and the remainder in the ratio of their contributions. Calculate the total amount of money received by Diba. (4 marks)

Amount shared equally $\frac{12}{100} \times 46800 = 5616$ Remaining amount $(46{,}800 - 5616) = 41184$ **Diba** Earning from amount shared equally $\frac{14}{40} \times 41184 = sh.14414.4$ **Diba Total earnings** $(14414.4 + (\frac{5616}{4}))$ $Sh.15818.4$	M1 for amount shared equally M1 for getting Diba's share by ratio M1 Summing up two shares A1 for correct Total Diba's earning

b) A salesman gets a commission of 2.4% on the sales up to $sh.100{,}000$. He gets an additional commission of 1.5% on sales above sh. 100,000. Calculate the commission he gets on sales worth $sh.280{,}000$.
(4 marks)

Commission earned on sales up to 100,000 $\frac{2.4}{100} \times 100{,}000 = sh.2400$ Condition (sales above condition) $280{,}000 - 100{,}000$ Commission earned on sales above 100,000 $\frac{1.5}{100} \times 180{,}000 = sh.2700$ Total commission $sh.(2700 + 2400)$ $= sh.5100$	M1 getting Commission earned on sales up to 100,000 M1 getting Commission earned on sales above 100,000 M1 getting the condition A1 getting total commission

c) The diagonals of a rhombus measure 9.2 cm and 7.5 cm respectively. Calculate the area of the rhombus (2 Marks)

Area of the rhombus A= $\frac{1}{2}d1d2$ $\frac{1}{2} \times 9.2 \times 7.5$ $34.5\ cm^2$	M1 A1

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