KENYA CERTIFICATE OF BASIC EDUCATION (K.C.B.E)

GRADE 10 CORE MATHEMATICS TERM 1 JANUARY 2026

Time: 2 Hours

COMPETENCY BASED EDUCATION CKEAB 001

LEARNER'S DETAILS

Name: _____.

School: _____.

Assessment Number: _____. **Date:** _____

School Code: _____. **Signature:** _____

INSTRUCTIONS TO LEARNERS

1. Write your name, school, assessment number, date, school code and then sign.
2. Answer all questions in Section A.
3. Answer any **five** questions in Section B.
4. Show all your working.
5. Use mathematical tables or a calculator where necessary .

SCORE GRID Section	Q1	Q2	Q3a	Q3b	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Section Total (40)
Marks (Max)	4	2	1	1	4	1	2	4	4	4	5	40
Learner Score												

Section	Q11a	Q11b	Q11c	Q12a	Q12b	Q12c	Q13a	Q13b	Q13c	Q14a	Q14b	Q14c	Q15a	Q15b	Q15c	Q16a	Q16b	Q16c	Q17a	Q17b	Q17c	Section Total (60)
Marks (Max)	3	3	6	4	4	4	4	4	4	3	3	6	3	3	6	4	4	4	4	4	4	60
Learner Score																						

Section	Max Marks	Learner Score
A	40	
B	60	
TOTAL	**100**	

Level	Level	% Range	Points	Learner's score
Exceeding (EE)	EE1	90–100%	8	
	EE2	75–89%	7	
Meeting (ME)	ME1	58–74%	6	
	ME2	41–57%	5	
Approaching (AE)	AE1	31–40%	4	
	AE2	21–30%	3	
Below (BE)	BE1	11–20%	2	
	BE2	1–10%	1	

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SECTION A: (40 Marks)

Answer all questions in this section.

1. A shopkeeper sold 15 boxes of sugar. If the number of boxes sold yesterday was **15**, classify the number as **even, odd, prime, or composite**. Explain your answer.

2. A machine produces 8 units per hour. Find the **reciprocal** of the production rate.

3. Determine whether the following numbers are **rational or irrational**:

(a) $\sqrt{49}$

(b) $\sqrt{2}$

4. Using a calculator, find the reciprocal of 0.25 and show your working in fraction form.

5. Express $5^3 \times 5^4$ as a single power of 5.

6. Simplify $\frac{2^5 \times 2^3}{2^4}$.

7. Using logarithm tables, find log250 to **4 decimal places**.

8. Simplify $\log 100 + \log 0.1$ using the laws of logarithms.

9. Evaluate $(27)^{\frac{2}{3}}$.

10. Expand and simplify $(x + 3)(x - 5)$.

SECTION B: 60 MARKS

Answer any five questions.

11. A trader invests Ksh 5000 in a business. The growth of the investment is modeled by the expression $A = 5000 \times 2^n$, where n is the number of months.

a) Evaluate A after 3 months. (3 marks)

b) Express $2^3 \times 2^4$ as a single power and verify your answer. (3 marks)

c) Using logarithms, find the number of months n required for the investment to reach Ksh 80,000. (6 marks)

12. A group of students is designing a rectangular garden. The area A in square meters is given by $A = x^2 + 5x - 24$.

a) Factorize the quadratic expression. (4 marks)

b) Determine the possible values of x if $A = 0$. (4 marks)

c) Verify your solutions by substitution. (4 marks)

13. An engineer is analyzing load on a bridge. The load is modeled by $P = 10^x$.

a) If $P = 1000$, find x using logarithms to base 10. (4 marks)

b) Simplify $\frac{10^6 \times 10^2}{10^3}$ using the laws of indices. (4 marks)

c) Evaluate $(100)^{3/2}$. (4 marks)

14. A student measures the side lengths of a cube as x cm. The volume V is $V = x^3$.

a) Express V in terms of powers if $x = 2y$. (3 marks)

b) Simplify $(3^2)^4$ using the laws of indices. (3 marks)

c) If $V = 512$, find x. (6 marks)

15. A store reduces the price of a TV from Ksh 45,000 to Ksh 36,000.

a) Calculate the fraction representing the discount. (3 marks)

b) Express $45{,}000 - 36{,}000$ as a factorized quadratic if necessary. (3 marks)

c) If the discount is repeated every year, express the price after 3 years using powers. (6 marks)

16. The population of a town grows according to $P = 5000(1.1)^t$, where t is in years.

a) Find the population after 5 years. (4 marks)

b) Determine t if the population reaches 10,000 using logarithms. (4 marks)

c) Simplify $(1.1)^3 \times (1.1)^2$ using the laws of indices. (4 marks)

17. A rectangle has length $x + 2$ and width $x - 3$. The area is $2x^2 - 5x - 12$.

a) Form a quadratic equation from the area expression. (4 marks)

b) Solve the quadratic equation by factorization. (4 marks)

c) Interpret the solutions in the context of the rectangle's dimensions. (4 marks)

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