END TERM 3 2026

GRADE 10

ESSENTIAL MATHEMATICS

TIME: 2 HOURS 30 MINUTES

Name: _____

Assessment Number: _____

Class / Stream: _____

Date: _____

INSTRUCTIONS TO CANDIDATES

- Answer ALL questions.
- Show all working clearly. Unsupported answers may not earn full marks.
- Use a calculator where appropriate.
- Give answers to a suitable degree of accuracy where necessary.
- Use π = 22/7 unless otherwise stated.
- Draw and label diagrams accurately where required.
- All answers must be written in the spaces provided or in the space immediately following each question.

EXAMINER'S USE ONLY

Section	Questions	Maximum Score	Candidate's Score
A	1–5	30	
B	6–10	35	
C	11–15	35	
TOTAL		100	

GRADE 10 END TERM 3 2026 SUMMATIVE ASSESSMENT

This is a cumulative assessment of the complete Grade 10 Essential Mathematics Curriculum Design.

SECTION A: NUMBERS AND ALGEBRA

1. (a) Classify each number as rational or irrational: $\sqrt{49}$, $\sqrt{7}$, 0.125, π. **(4 marks)**

(b) Evaluate: $3/4 - 2/3 \times 9/8$. **(3 marks)**

(c) A patient's temperature changes from 38.6 °C to 37.2 °C. Determine the change in temperature. **(2 marks)**

2. (a) Simplify: $2^3 \times 2^5 \div 2^4$. **(2 marks)**

(b) Express 0.00072 in index form and state the value of its reciprocal. **(3 marks)**

(c) Simplify: $(3^2 \times 3^{-1})^2$. **(3 marks)**

3. (a) Factorise completely: $x^2 - 7x + 12$. **(3 marks)**

(b) Solve by factorisation: $x^2 - 5x - 14 = 0$. **(4 marks)**

(c) The length of a rectangle is 3 m more than its width. Its area is 40 m². Form a quadratic equation and determine its dimensions. **(4 marks)**

4. (a) Two similar containers have corresponding lengths in the ratio 2:5. Determine the ratio of their areas. **(2 marks)**

(b) A model is enlarged using a linear scale factor of 3. State the corresponding area scale factor and volume scale factor. **(3 marks)**

5. A learner's weekly transport expenditure is shown below. **(6 marks)**

Day	Mon	Tue	Wed	Thu	Fri
Amount (KSh)	120	150	100	180	200

(a) Calculate the mean daily expenditure. **(2 marks)**

(b) If the learner has KSh 1,000 for transport, determine the balance after the five days. **(2 marks)**

(c) Give one reason why organising and interpreting such data can support decision-making. **(2 marks)**

SECTION B: MEASUREMENTS AND GEOMETRY

6. The coordinates of A(2, 3) and B(8, 3) are given. A reflection is made in the y-axis. **(6 marks)**

(a) State the coordinates of A′ and B′. **(2 marks)**

(b) Describe the transformation used. **(2 marks)**

(c) State the perpendicular distance of A from the mirror line before reflection. **(2 marks)**

7. A right-angled triangular field has perpendicular sides 9 m and 12 m. **(7 marks)**

(a) Determine the length of the hypotenuse. **(2 marks)**

(b) Determine $\sin\theta$, $\cos\theta$ and $\tan\theta$ for the angle opposite the 9 m side. **(3 marks)**

(c) A tree is observed from a point on level ground at an angle of elevation of 30°. If the point is 12 m from the foot of the tree, determine the height of the tree. **(2 marks)**

8. (a) A triangle has sides 13 cm and 14 cm enclosing an angle of 30°. Determine its area. **(3 marks)**

(b) Determine the area of a rhombus whose diagonals are 10 cm and 16 cm. **(2 marks)**

(c) A regular hexagon has side length 8 cm. Explain one method that could be used to determine its area. **(2 marks)**

9. A circular garden has radius 14 m. **(7 marks)**

(a) Determine its area. **(3 marks)**

(b) A sector subtends 90° at the centre. Determine the area of the sector. **(2 marks)**

(c) Determine the area of the corresponding segment if the triangle formed by the two radii and chord has area 98 m². **(2 marks)**

10. (a) A cuboid measures 8 cm by 5 cm by 3 cm. Determine its total surface area. **(3 marks)**

(b) A cone has radius 7 cm and height 24 cm. Determine its volume. **(3 marks)**

(c) A container is in the shape of a frustum. State the information required to calculate its volume. **(1 marks)**

SECTION C: VOLUME, COMMERCIAL ARITHMETIC, STATISTICS AND PROBABILITY

11. A cylindrical water tank has radius 1.4 m and height 2.5 m. **(6 marks)**

(a) Calculate its capacity in cubic metres. **(3 marks)**

(b) Convert the capacity to litres. **(1 marks)**

(c) If the tank is 80% full, determine the volume of water in it. **(2 marks)**

12. A trader buys goods for KSh 24,000. The goods are sold at a profit of 15%. **(7 marks)**

(a) Determine the profit. **(2 marks)**

(b) Determine the selling price. **(2 marks)**

(c) A customer is given a 10% discount on the selling price. Determine the amount paid by the customer. **(3 marks)**

13. The numbers of books read by 12 learners in a month are: 2, 4, 3, 5, 2, 6, 4, 3, 2, 5, 4, 8. **(8 marks)**

(a) Prepare a frequency distribution table. **(3 marks)**

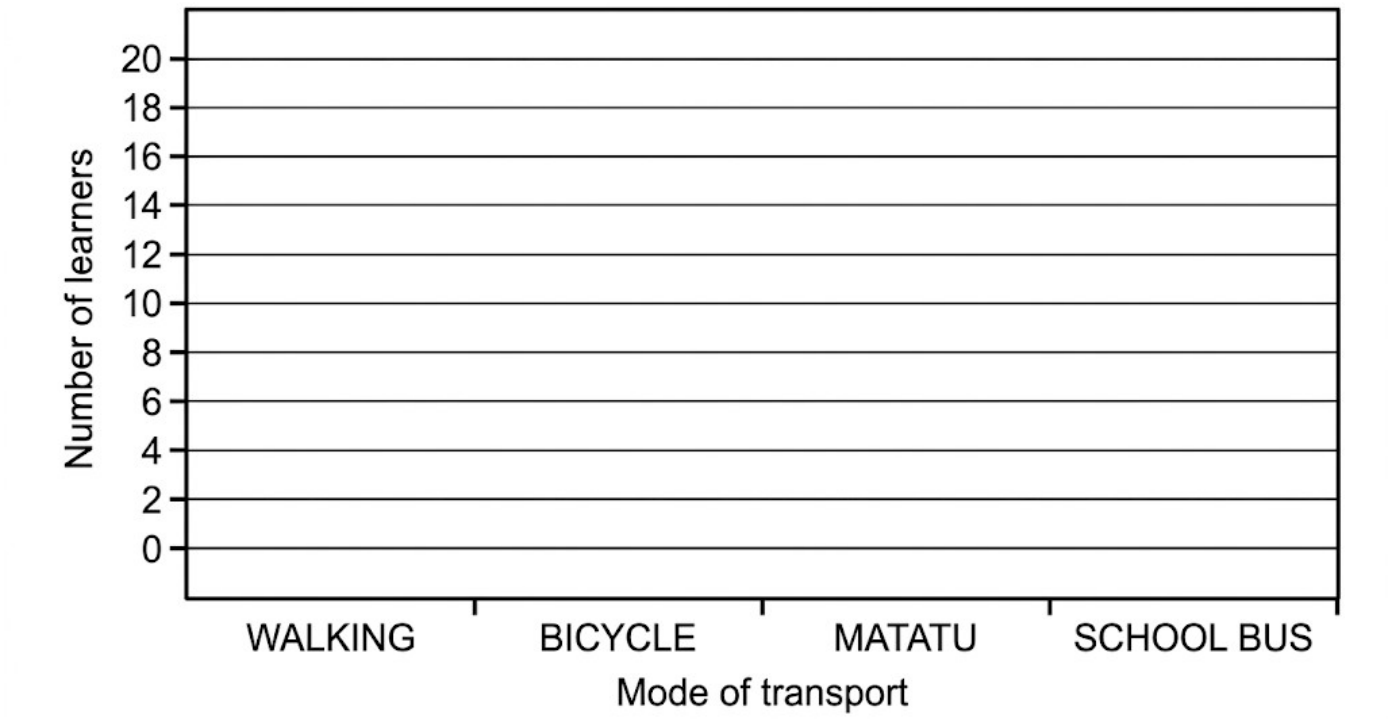
(b) Determine the mode and median. **(3 marks)**

(c) State one conclusion that can be made from the data. **(2 marks)**

14. The following data show the number of learners using different modes of transport to school. **(6 marks)**

Mode	Walking	Bicycle	Matatu	School bus
Number of learners	12	8	20	10

(a) Draw a suitable bar graph to represent the data. **(3 marks)**



(b) State which mode is most common and give the number of learners using it. **(2 marks)**

(c) Give one reason why a graph can be useful when interpreting data. **(1 marks)**

15. (a) A fair die is rolled once. Determine the probability of obtaining an even number. **(2 marks)**

(b) A bag contains 4 red balls and 6 blue balls. One ball is selected at random. Determine the probability of selecting a red ball. **(2 marks)**

(c) A coin is tossed and a die is rolled. Determine the probability of obtaining a head and a six. **(3 marks)**

(d) Explain why understanding probability can help a person make responsible decisions in real-life situations. **(3 marks)**

END OF QUESTION PAPER