

END TERM 3 2026

GRADE 10

ESSENTIAL MATHEMATICS

MARKING SCHEME & TEACHER'S GUIDE

M — method/process mark; A — accuracy/correct answer; C — correct concept or mathematical point.

Accept equivalent correct methods and exact mathematical reasoning. Do not award marks twice for the same step.

1(a) — 4 marks

$\sqrt{49} = 7$, rational — 1

$\sqrt{7}$, irrational — 1

0.125, rational — 1

π , irrational — 1

1(b) — 3 marks

Correct multiplication: $2/3 \times 9/8 = 3/4$ — M1

Correct subtraction: $3/4 - 3/4$ — A1

Answer 0 — A1

1(c) — 2 marks

$38.6 - 37.2$ — M1

Change = 1.4°C — A1

2(a) — 2 marks

2^{3+5-4} — M1

Answer $2^4 = 16$ — A1

2(b) — 3 marks

$0.00072 = 7.2 \times 10^{-4}$ — 1

Reciprocal = $1/(7.2 \times 10^{-4})$ — 1

Correct value ≈ 1388.89 — 1

2(c) — 3 marks

$3^2 \times 3^{-1} = 3^1$ — M1

$(3^1)^2 = 3^2$ — M1

Answer 9 — A1

3(a) — 3 marks

Factors whose product is 12 and sum is -7 — 1

Correct grouping — 1

$(x - 3)(x - 4)$ — 1

3(b) — 4 marks

Correct factorisation — M1

$(x - 7)(x + 2) = 0$ — M1

$x = 7$ — A1

$x = -2$ — A1



3(c) — 4 marks

Let width = x and length = $x + 3$ — 1

$$x(x + 3) = 40 \text{ or } x^2 + 3x - 40 = 0 \text{ — 1}$$

$$(x + 8)(x - 5) = 0; \text{ positive width } 5 \text{ — 1}$$

Dimensions 5 m by 8 m — 1

4(a) — 2 marks

Area ratio is square of linear ratio — 1

4:25 — 1

4(b) — 3 marks

$$\text{Area scale factor} = 3^2 = 9 \text{ — 1}$$

$$\text{Volume scale factor} = 3^3 = 27 \text{ — 1}$$

Correct statement linking scale factors to dimensions — 1

5(a) — 2 marks

$$\text{Total} = 750 \text{ — M1}$$

$$\text{Mean} = 150 \text{ KSh — A1}$$

5(b) — 2 marks

$$1000 - 750 \text{ — M1}$$

$$\text{Balance} = \text{KSh } 250 \text{ — A1}$$

5(c) — 2 marks

Any valid decision-making explanation — 2

6(a) — 2 marks

$$A'(-2,3) \text{ — 1}$$

$$B'(-8,3) \text{ — 1}$$

6(b) — 2 marks

Reflection in the y-axis — 2

6(c) — 2 marks

Distance from $A(2,3)$ to y-axis = 2 units — 2

7(a) — 2 marks

$$c^2 = 9^2 + 12^2 \text{ — M1}$$

$$c = 15 \text{ m — A1}$$

7(b) — 3 marks

$$\sin \theta = 9/15 = 3/5 \text{ — 1}$$

$$\cos \theta = 12/15 = 4/5 \text{ — 1}$$

$$\tan \theta = 9/12 = 3/4 \text{ — 1}$$

7(c) — 2 marks

$$\tan 30^\circ = h/12 \text{ — M1}$$

$$h = 12 \tan 30^\circ \approx 6.93 \text{ m — A1}$$

8(a) — 3 marks

$$\begin{aligned}\text{Area} &= \frac{1}{2} ab \sin C \text{ — 1} \\ &= \frac{1}{2} \times 13 \times 14 \times \sin 30^\circ \text{ — 1} \\ &= 45.5 \text{ cm}^2 \text{ — 1}\end{aligned}$$

8(b) — 2 marks

$$\begin{aligned}\text{Area} &= \frac{1}{2} d_1 d_2 \text{ — 1} \\ &= 80 \text{ cm}^2 \text{ — 1}\end{aligned}$$

8(c) — 2 marks

Valid method such as divide into equilateral triangles — 1
Correct use of side/apothem/triangle areas — 1

9(a) — 3 marks

$$\begin{aligned}A &= \pi r^2 \text{ — 1} \\ &= \frac{22}{7} \times 14^2 \text{ — 1} \\ &= 616 \text{ m}^2 \text{ — 1}\end{aligned}$$

9(b) — 2 marks

Sector is $90/360$ of circle — 1
Area = 154 m^2 — 1

9(c) — 2 marks

Segment = sector – triangle — 1
 $154 - 98 = 56 \text{ m}^2$ — 1

10(a) — 3 marks

TSA = $2(lw + lh + wh)$ — 1
Correct substitution — 1
TSA = 158 cm^2 — 1

10(b) — 3 marks

$V = \frac{1}{3}\pi r^2 h$ — 1
Correct substitution — 1
 $V = 1232 \text{ cm}^3$ — 1

10(c) — 1 marks

Upper/lower radii and perpendicular height — 1

11(a) — 3 marks

$V = \pi r^2 h$ — 1
Correct substitution — 1
 $V = 15.4 \text{ m}^3$ — 1

11(b) — 1 marks

$15.4 \text{ m}^3 = 15,400 \text{ litres}$ — 1

11(c) — 2 marks

0.8×15.4 — M1
 12.32 m^3 — A1

12(a) — 2 marks

15% of 24,000 — M1

Profit = KSh 3,600 — A1

12(b) — 2 marks

24,000 + 3,600 — M1

Selling price = KSh 27,600 — A1

12(c) — 3 marks

Discount = $10\% \times 27,600$ — 1

Discount = KSh 2,760 — 1

Amount paid = KSh 24,840 — 1

13(a) — 3 marks

Correct distinct values 2,3,4,5,6,8 — 1

Correct frequencies — 1

Correct complete frequency table — 1

13(b) — 3 marks

Mode = 2 — 1

Ordered data correctly identified — 1

Median = $(3 + 4)/2 = 3.5$ — 1

13(c) — 2 marks

Any valid conclusion supported by the data — 2

14(a) — 3 marks

Correct axes/scale — 1

Correct bars at 12, 8, 20, 10 — 1

Labels and neat plotting — 1

14(b) — 2 marks

Matatu — 1

20 learners — 1

14(c) — 1 marks

Any valid explanation of visual comparison/pattern recognition — 1

15(a) — 2 marks

Favourable outcomes 3 of 6 — 1

$P(\text{even}) = 1/2$ — 1

15(b) — 2 marks

Total balls = 10 — 1

$P(\text{red}) = 4/10 = 2/5$ — 1

15(c) — 3 marks

$P(\text{head}) = 1/2$ — 1

$P(\text{six}) = 1/6$ — 1

Independent events: $\frac{1}{2} \times \frac{1}{6} = \frac{1}{12} \rightarrow 1$

15(d) — 3 marks

Valid explanation about estimating likelihood — 1

Use of probability to compare risks/chances — 1

Responsible decision-making example — 1

CURRICULUM TRACEABILITY

Q	Curriculum Area	Cognitive Demand	Marks
1	1.1 Real Numbers	Knowledge/Application	9
2	1.2 Indices	Application	8
3	1.3 Quadratic Equations I	Application/Problem solving	11
4	2.1 Similarity and Enlargement	Application	5
5	3.1 Statistics I / real-life data	Application	6
6	2.2 Reflection	Application	6
7	2.3 Trigonometry	Application	7
8	2.4 Area of Polygons	Application	7
9	2.5 Area of Part of a Circle	Application	7
10	2.6 Surface Area of Solids	Application	7
11	2.7 Volume and Capacity	Application	6
12	2.8 Commercial Arithmetic I	Application	7
13	3.1 Statistics I	Analysis	8
14	3.1 Statistics I	Application/Interpretation	6
15	3.2 Probability I	Application/Reasoning	10

COVERAGE VERIFICATION

- Strand 1.0 Numbers and Algebra: 1.1 Real Numbers, 1.2 Indices, 1.3 Quadratic Equations I.
- Strand 2.0 Measurements and Geometry: 2.1 Similarity and Enlargement, 2.2 Reflection, 2.3 Trigonometry, 2.4 Area of Polygons, 2.5 Area of a Part of a Circle, 2.6 Surface Area of Solids, 2.7 Volume and Capacity, 2.8 Commercial Arithmetic I.
- Strand 3.0 Statistics and Probability: 3.1 Statistics I and 3.2 Probability I.
- All 13 Grade 10 sub-strands in the supplied Curriculum Design are assessed.
- The paper uses structured-response questions only and contains no MCQs or conventional objective-test items.
- Graphical representation is assessed through a bar graph task, consistent with the Statistics I curriculum.
- Marks total 100.

TEACHER / EXAMINER GUIDANCE

- Use M/A/C principles where appropriate and credit correct alternative methods.
- Do not penalise a candidate twice for a single error carried through correctly unless the resulting method becomes mathematically invalid.
- Where a question requests a diagram or graph, assess both mathematical accuracy and the required labels/representation.
- Accept equivalent correct answers at the same level of mathematical precision.
- Check all arithmetic before final recording of marks.

TOTAL: 100 MARKS

END OF MARKING SCHEME