

KENYA CERTIFICATE OF BASIC EDUCATION

SENIOR SCHOOL ASSESSMENT

AUGUST ASSIGNMENT 2026

GRADE 10 – ESSENTIAL MATHEMATICS 006 JUNE

Time: 2 Hours

LEARNER'S DETAILS



Name: _____ . School: _____ .

Assessment Number: _____ . Date: _____ .

School Code: _____ . Signature: _____ .

INSTRUCTIONS TO CANDIDATES

1. Write your full name in the space provided above.
2. Indicate your school, stream, admission number, and date clearly.
3. This paper has **TWO sections: A and B**.
4. Attempt **ALL questions** in both sections.
5. Show all working clearly where necessary.
6. Write all answers in the spaces provided.
7. Do NOT remove any page from this paper.

FOR OFFICIAL USE ONLY

SECTION	SECTION A	SECTION B	% SCORE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANGE	30 MARKS	50 MARKS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

Answer **ALL** questions in this section.

1. A teacher gives learners different numbers to classify while studying number systems in a digital coding lesson.

Classify the following numbers as **rational or irrational**:

2, $\sqrt{2}$, $\frac{5}{8}$, 0.333 ..., 2.85

b) A computer program requires finding reciprocals for encryption keys.
Find the reciprocal of:

$$-\frac{3}{5}$$

2. A student buys ingredients for baking:

i. $\frac{3}{4}$ kg sugar

ii. $\frac{2}{3}$ kg flour

iii. $\frac{5}{6}$ kg milk powder is used for another recipe

Evaluate:

$$\frac{3}{4} + \frac{2}{3} - \frac{5}{6}$$

3. A computer system compresses files using powers of 2.

Simplify:

$$\frac{2^5 \times 2^3}{2^4}$$

4. A floor designer models square tiles with area expression:

$$x^2 - 5x + 6$$

Factorise the expression to determine tile dimensions.

5. A carpenter designs two triangular wooden frames for roofing.

Triangle ABC has sides:

AB = 3 cm, BC = 4 cm, CA = 5 cm

Triangle DEF is similar and has:

DE = 8 cm, EF = 10 cm, and one missing side

Find:

a) Scale factor

b) Missing side

6. A drone maps a point on a straight road at A(2,3). The road is represented by the x-axis.

Find the image of A after reflection.

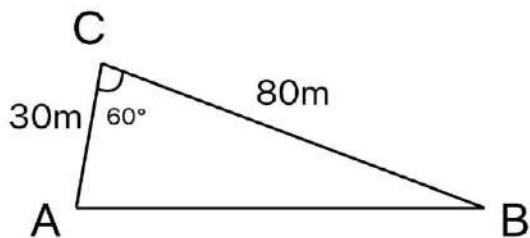
7. A ladder leans against a wall making an angle of 30° with the ground.
The ladder is 10 m long.

Find:

a) Height reached on the wall

b) Distance from wall

8. A surveyor measures a triangular piece of land:



Find the area of the triangle.

9. A pizza is cut into a sector for a customer.



Find the area of the sector.

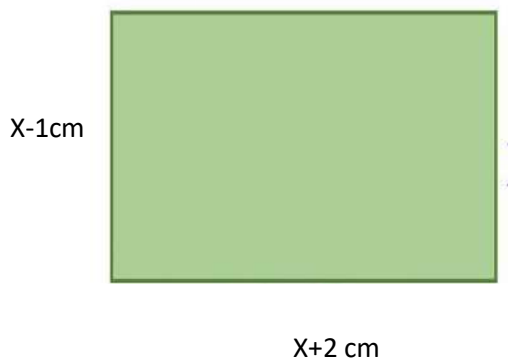
10. A teacher records marks of a student:

2, 4, 6, 8, 10

Find the mean score.

SECTION B (50 MARKS)

11. A builder constructs a rectangular garden:



If the Area = 12 m^2

a) Form a quadratic equation

b) Solve for x

c) Find actual dimensions

12. A tech company uses powers of 3 in encryption.

Simplify:

$$(3^2 \times 3^4) \div 3^3$$

Also express 81 in base 3 index form.

13. A logo is enlarged on a billboard.

If the Original area = 10 cm^2
and the Scale factor = 2

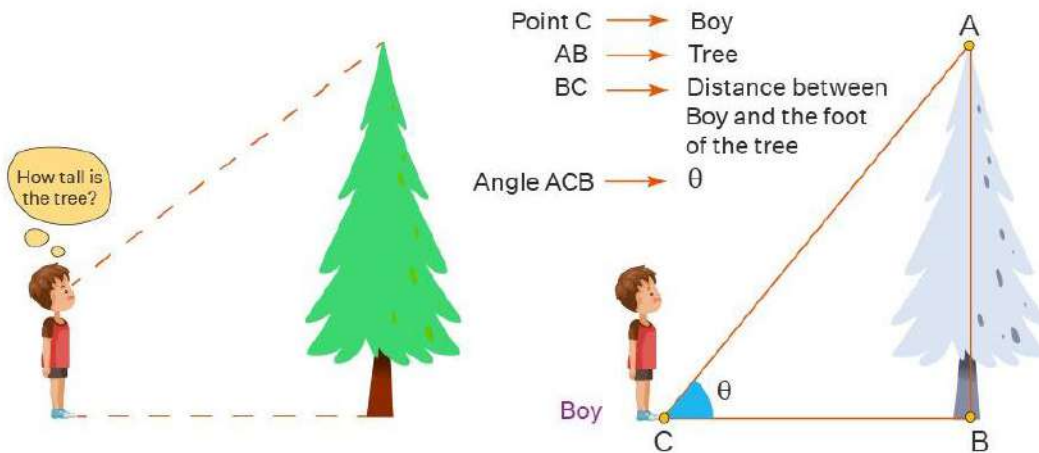
Find:

a) New area

b) Volume scale factor

c) Two properties of similar figures

14. A surveyor measures the height of a tree:



The Angle of elevation = 45° . The Distance from tree = 10 m
Find height.

15. A factory produces cones:

The radius of a cone is 3 cm while its Height = 4 cm

Find:

a) Slant height

b) Total surface area

c) Volume

16. A trader in Nairobi sells phones:

- The cost price of the phone = 20,000
- The selling price of the phone = 25,000

Also:

- Discount = 10% on KSh 5,000 item

Find:

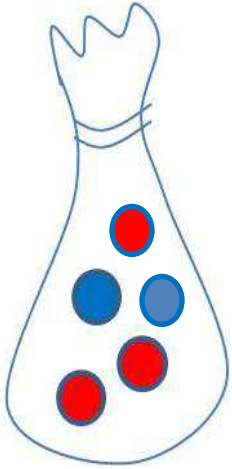
a) Profit

b) Percentage profit

c) Discount

d) Selling price after discount

17. A bag contains three red balls and two blue colored balls:



Find:

a) Probability of red

b) Probability of blue

c) Whether events are equally likely

d) Define mutually exclusive events

MARKING SCHEME

SECTION A

1

- $2 \rightarrow$ Irrational
- $\sqrt{2} \rightarrow$ Irrational
- $5/8 \rightarrow$ Rational
- $0.333... \rightarrow$ Rational
- $2.85 \rightarrow$ Rational

b)

$$-\frac{3}{5} \rightarrow -\frac{5}{3}$$

2

$$\frac{3}{4} + \frac{2}{3} - \frac{5}{6}$$

LCM = 12

$$= \frac{9}{12} + \frac{8}{12} - \frac{10}{12} = \frac{7}{12}$$

✓ Answer: **7/12**

3

$$2^{5+3-4} = 2^4 = 16$$

✓ Answer: **16**

Q4

$$x^2 - 5x + 6 = (x - 2)(x - 3)$$

✓ Answer: **(x-2)(x-3)**

5

Scale factor:

$$8/4 = 2$$

Missing side:

$$3 \times 2 = 6$$

✓ Answers:

- a) 2
- b) 6 cm

6

$$(2,3) \rightarrow (2,-3)$$

7

Opposite:

$$10\sin 30^\circ = 5$$

Adjacent:

$$10\cos 30^\circ = 8.66$$

8

$$A = \frac{1}{2} \times 6 \times 8 \times \sin 60 = 20.8 \text{ cm}^2$$

9

$$A = \frac{60}{360} \times \pi \times 100 = 52.3 \text{ cm}^2$$

10

Mean:

SECTION B

11

$$(x + 2)(x - 1) = 12x^2 + x - 14 = 0 \quad x = 2$$

Dimensions:

4 cm and 1 cm

12

$$2781 = 3^4$$

13

a) 40 cm^2

b) 8

c) same shape, equal angles

14

$$\text{Height} = 10m$$

15

a) 5 cm

b) 75.4 cm^2

c) 37.7 cm^3

16

a) 5,000

b) 25%

c) 500

d) 4,500

17

a) $3/5$

b) $2/5$

c) Not equal

d) Cannot occur at same time