ELIMU254 TOPICAL REVISION

Kenya CBC | Senior School | Grade 10

Name		**Class**	
School		**Year**	

TOPICAL REVISION QUESTIONS

GRADE 10: MATHEMATICS: ALL STRANDS

165 questions in 14 exercises, with all the answers at the back

HOW TO USE THIS BOOK

1. Each subject follows the KICD curriculum design strand by strand. There is one exercise for every sub-strand, in the order it is taught.
2. Do an exercise after the sub-strand is taught, for revision before a test, or as homework and holiday work.
3. Answer in the spaces provided. For a multiple-choice question, circle the letter (A, B, C or D) of the correct answer.
4. The marks for each question are shown in brackets. Show your working where a question needs it.
5. The answers for every exercise are at the back of the book, subject by subject, for the teacher or parent to mark.

SUBJECTS IN THIS BOOK

Subject	Exercises	Questions
Mathematics	14	165

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MATHEMATICS

Revision questions

NUMBERS AND ALGEBRA

Exercise 1: Real Numbers (26 marks)

1. Which of these numbers is irrational? (1 mark)

A 0.25 **B** 22/7

C square root of 5 **D** square root of 16

2. The reciprocal of 0.04 is: (1 mark)

A 25 **B** 0.25

C 4 **D** 2.5

3. How many prime numbers lie between 20 and 40? (1 mark)

A 3 **B** 5

C 6 **D** 4

4. From the numbers 1, 2, 9, 15, 17, 21, 23, 27, list (a) the prime numbers (b) the composite numbers. (c) Which number is neither prime nor composite? (3 marks)

5. Classify each number as rational or irrational: 0.75, square root of 7, 22/7, 0.333..., square root of 49, pi. (3 marks)

6. Express the recurring decimal 0.272727... as a fraction in its simplest form. (3 marks)

7. Find the reciprocal of each number by division.

(a) 0.25 (1 mark)

(b) 2.5 (1 mark)

(c) 1¼ (1 mark)

8. Use mathematical tables or a calculator to find the reciprocal of 36.5, correct to 4 significant figures. (2 marks)

9. Using reciprocals, evaluate 1/0.25 + 1/0.04 without a calculator. (2 marks)

10. A water pipe fills a tank in 0.0625 of an hour per 1,000 litres. Using the reciprocal of 0.0625, find how many litres it delivers in 3 hours. (3 marks)

CHALLENGE: harder questions to stretch the best learners

11. Which statement is TRUE? (1 mark)

A Every prime number is odd

B 1 is a prime number

C The sum of two irrational numbers is always irrational

D Square root of 2 × square root of 8 is rational

12. Express 0.2333... (the 3 recurring) as a fraction in its simplest form. (3 marks)

Exercise 2: Indices and Logarithms (31 marks)

1. 8 to the power 2/3 equals: (1 mark)

A 16/3 **B** 4

C 2 **D** 64

2. log 0.001 = (1 mark)

A -3 **B** 3

C -2 **D** 0.001

3. If 2^(x + 1) = 32, then x = (1 mark)

A 5 **B** 16

C 3 **D** 4

4. Express 1,296 in index form using its prime factors. (2 marks)

5. Simplify, leaving your answer in index form:

(a) a^5 × a^3 ÷ a^2 (1 mark)

(b) (2x^3)^2 × 3x^-4 (2 marks)

6. Evaluate without a calculator: (a) 27 to the power 2/3 (b) 16 to the power (-¾). (3 marks)

7. Solve for x: 9^x = 27^(x - 1). (3 marks)

8. Write in logarithm form: (a) 10^3 = 1,000 (b) 10^(-2) = 0.01. (2 marks)

9. Use tables or a calculator to find log 345, correct to 4 decimal places. (2 marks)

10. Use logarithms to evaluate 864 ÷ 2.4. (4 marks)

11. Use logarithms to evaluate 45.6 × 3.12, correct to 4 significant figures. (4 marks)

CHALLENGE: harder questions to stretch the best learners

12. Simplify (8 to the power 1/3 × 4 to the power -½) ÷ 16 to the power ¼. (1 mark)

A ½ **B** 2

C 1 **D** 4

13. Solve for x: 3^(2x) - 10 × 3^x + 9 = 0. (Hint: let y = 3^x.) (4 marks)

Exercise 3: Quadratic Expressions and Equations 1 (36 marks)

1. $(x - 3)^2$ expands to: (1 mark)

A $x^2 - 9$ **B** $x^2 + 9$

C $x^2 - 6x + 9$ **D** $x^2 - 6x - 9$

2. The factors of $x^2 - x - 12$ are: (1 mark)

A $(x - 4)(x + 3)$ **B** $(x + 4)(x - 3)$

C $(x - 6)(x + 2)$ **D** $(x - 12)(x + 1)$

3. The roots of $x^2 - 9x + 20 = 0$ are: (1 mark)

A -4 and -5 **B** 4 and 5

C 2 and 10 **D** -2 and -10

4. A rectangular garden is (x + 4) m long and (x - 1) m wide. Write an expression for its area in the form $ax^2 + bx + c$. (2 marks)

5. Expand and simplify (2x + 3)(x - 5). (2 marks)

6. Use quadratic identities to evaluate without a calculator:

(a) 103^2 (2 marks)

(b) 98^2 (2 marks)

(c) $53^2 - 47^2$ (2 marks)

7. Factorise completely:

(a) $x^2 + 7x + 12$ (2 marks)

(b) $6x^2 - x - 2$ (2 marks)

(c) $9x^2 - 16$ (1 mark)

8. Solve the equation $x^2 - 5x - 14 = 0$ by factorisation. (3 marks)

9. Solve $2x^2 + 5x - 3 = 0$. (3 marks)

10. The length of a rectangular plot is 5 m more than its width. Its area is 84 m^2. Form a quadratic equation and solve it to find the length and width of the plot. (4 marks)

11. The product of two consecutive odd numbers is 143. Find the numbers. (3 marks)

CHALLENGE: harder questions to stretch the best learners

12. If $x + 1/x = 5$, then $x^2 + 1/x^2 =$ (1 mark)

A 25 **B** 27

C 23 **D** 10

13. A photograph 20 cm by 15 cm is placed in a frame of uniform width x cm. The total area of photograph and frame is 500 cm². Find x. (4 marks)

MEASUREMENTS AND GEOMETRY

Exercise 4: Similarity and Enlargement (30 marks)

1. Two similar cylinders have radii 3 cm and 6 cm. The ratio of their volumes is: (1 mark)

A 1:2 **B** 1:4

C 1:6 **D** 1:8

2. Under an enlargement with scale factor 3, a triangle of area 5 cm² has an image of area: (1 mark)

A 15 cm² **B** 45 cm²

C 135 cm² **D** 25 cm²

3. An enlargement with a negative scale factor puts its image: (1 mark)

A on the opposite side of the centre, upside down **B** on the same side of the centre

C at the centre **D** in the mirror line

4. Triangle ABC has vertices A(1, 1), B(3, 1) and C(1, 2). It is enlarged with centre (0, 0) and linear scale factor 3. Find the coordinates of its image A'B'C'. (3 marks)

5. Under an enlargement, A(2, 1) maps to A'(4, 3) and B(3, 1) maps to B'(7, 3). Find the linear scale factor and the centre of enlargement. (4 marks)

6. The point P(2, 3) is enlarged with centre (0, 0) and linear scale factor -2. Find the coordinates of P', its image. (2 marks)