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THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN SECONDARY EDUCATION EXAMINATION

740

# MATHEMATICS

Time: 3 Hours

Friday, 15th May 2009 a.m.

## Instructions

1. This paper consists of sections A, B, and C.
2. Answer **all** questions in section A, **two (2)** questions from section B and **two (2)** questions from section C.
3. Section **A** carries 40 marks, section B carries 40 marks and section C carries 20 marks.
4. Cellular phones are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

This paper consists of 4 printed pages.



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## SECTION A (40 Marks)

Answer **all** questions in this section.

1. A survey of 240 houses showed that all of them kept a cat or a dog or both. If 180 houses kept dogs and 79 houses kept cats, how many houses kept both?

2. A die and a coin are tossed. Find the probability that a number greater than 4 appears on the die and a tail appears on the coin.

3. Prove that if A is a subset of B and B is a subset of C, then A is a subset of C.

4. Find the derivative of $f(x) = \sqrt{2x+1}$ from the first principle.

5. Construct a truth table for :
   (a) $p \rightarrow \sim q$.
   (b) $(\sim p \vee q) \leftrightarrow (p \rightarrow q)$.

6. In triangles ABC and DEF, angles A and B are respectively congruent to angles D and E. If side AB is represented by $3a - 6$ and side DE by $a+8$. For what values of '$a$' are the two triangles congruent?

7. Critically observe Figure 1. If the shaded part is a lake, find the length of the lake.

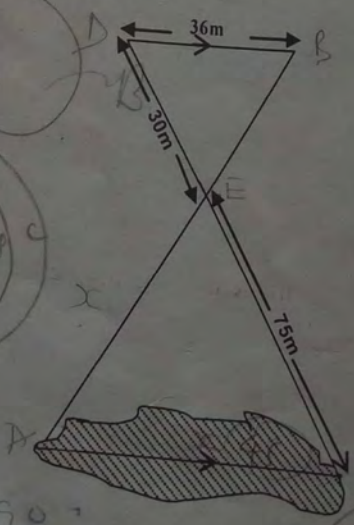


*Figure: 1*

8. Show that $\text{Cosh}^2 x - \text{Sinh}^2 x = 1$.

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9. In a Mathematics laboratory, one bag contains 10 marbles where 7 are red and 3 are black. During the Mathematics club session, a student drew one marble at random and then replaced it. If another student drew another marble at random, what is the probability that both marbles drawn are red?

10. A box is represented by Figure 2. Using the scale of 1cm : 20 cm draw the plan, front and side elevations of the box.

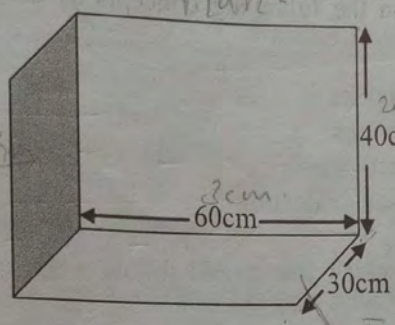


*Figure: 2*

## SECTION B (40 Marks)

Answer **two (2)** questions from this section.

11. Mathematics subject is perceived by many as a very difficult subject but also very important in facilitating day to day living of an individual. As a new Mathematics teacher in a secondary school, what will you do to help your learners develop interest in learning Mathematics?

12. Secondary school Mathematics syllabus has changed from content based to competence based.
    (a) Discuss the main reason for this change.
    (b) What is your role in implementing Mathematics competence – based teaching and learning?

13. Describe situations in which Mathematics subject is important to our daily life.

14. (a) What does the concept 'shift of paradigm' mean to Mathematics teaching and learning?
    (b) With examples, indicate how this shift is demonstrated in the
        (i) Secondary school Mathematics syllabus.
        (ii) Secondary school Mathematics teachers' guide.

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## SECTION C (20 Marks)

Answer **two (2)** questions from this section.

15. Discuss two important aspects of assessing Mathematics work.

16. Discuss the relationship between the competence and the specific objectives of the lesson plan.

17. Write short notes on the following concepts as used in planning Mathematics lesson.

    (a) Teaching activities
    (b) Learning activities
    (c) Assessment activities
    (d) Student's lesson evaluation

18. Elaborate the steps which you should follow when constructing a Mathematics test.

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