Candidate's No. ……

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION AND CULTURE
FORM TWO SECONDARY EDUCATION EXAMINATIONS, 2004

0041 **BASIC MATHEMATICS**

TIME: 2½ HOURS

INSTRUCTIONS

1. This paper consists of sections A and B.
2. Answer ALL Questions in both Sections.
3. Show clearly all the working and answer for each question item in both sections. Each answer sheet should have the candidate's number written on top.
4. Mathematical tables, instruments and graph papers may be used.
5. Electronic calculators and cell phones are not allowed in the examination room.

FOR EXAMINER'S USE ONLY		
QUESTION NUMBER	**SCORE**	**INITIALS OF EXAMINER**
1		
2		
3		
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22		
23		
24		
25		
TOTAL		

This paper consists of 5 printed pages.

SECTION A (60 MARKS)

Working and answers must be shown clearly for each question

1. (a) Simplify $14 - [-2 - (8 \div 2) + 5]$

   (b) Use the number line to find the sum of $(-5) + (-2)$

2. (a) Arrange $\frac{2}{5}$, $\frac{5}{8}$, 48% and 0.6 in ascending order.

   (b) Decrease 160,000 by 16%

3. (a) Write 3:15 p.m. using a 24 hours clock

   (b) Add

Kg	hg	g
60	9	960
	11	45

4. Express $2.\dot{7}\dot{9}$ as a fraction in the form $\frac{a}{b}$ where a and b are integers and $b \neq 0$.

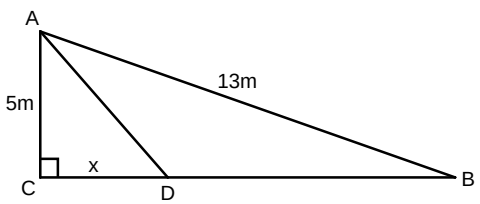
5. Rationalize the denominator of
$$\frac{p-q}{\sqrt{q}+\sqrt{p}}$$

6. Show on the number line the solution set of the inequality $|2x + 1| > 3$

7. Solve the following simultaneous equations
$$\frac{1}{x} + \frac{1}{y} = 7$$
$$\frac{2}{x} + \frac{3}{y} = 16$$

8. Two angles of a pentagon are $58°$ and $83°$. The other three angles are in the ratio $5:6:8$. Find the largest angle

9. Use Pythagoras' Theorem to find the length x in the diagram below.



10. At what rate should 2340/= be invested for 2 years in order to have an interest of 140.4/=?

11. (a) Without using tables evaluate $\frac{\sin 60^\circ}{\cos 60^\circ} \times \frac{\sin 30^\circ}{\cos 30^\circ}$

    (b) Given $\sin A = \frac{1}{2}$ where A is an acute angle, find the value of $1 - \cos^2 A$

12. (a) Simplify $\frac{\log 8 - \log 4}{\log 4 - \log 2}$

    (b) If $N = 2 \times 10^{-8}$ find the value of $\frac{1}{N}$ in scientific form.

13. Find the equation of the line through the point $(2, -2)$ crossing the y-axis at the same point as the line whose equation is $y = \frac{5}{2}x - 5$

14. In a class of 105 students, 25 study Mathematics but not History, 50 study History but not Mathematics. If each student studies at least one subject, determine the number of students who study Mathematics.

15. Twice the width of a rectangle is greater than its length by 3cm. If the perimeter of the rectangle is 36cm, find its dimensions.

16. A cylindrical tank of diameter 140cm contains water to a height of 2.2m. Calculate the volume of the water in litres.

17. (a) Transformation T maps the point (x, y) to $(x - y, x)$. Find the image of the point $(6, -2)$ under T.

    (b) Find the image of point $A(2, 6)$ after rotating it through 180°

18. Solve for n if:
    $\left(\frac{3}{5}\right)^{n-1} = \left(\frac{25}{9}\right)^{2n}$

19. Given that $x^2 + 8x + Q = (x + K)^2$ find the value of K and Q.

20. The area of a pond on the map is 0.25cm^2. If the map has a scale of 1:1000 find the true area of the pond in m^2.

SECTION B (40 MARKS)

Working and answers must be shown clearly for each question.

21. (a) In the formula $Tr^2 + (p - k)r + m = 0$, make r the subject of the formula

    (b) Given that $x + y = 8$ and $x^2 + y^2 = 40$, find the value of xy.

22. In a mathematics test the following marks were obtained:

    27, 57, 57, 40, 70, 48, 59, 60, 42, 44, 47, 44, 44, 59, 35, 48, 43, 52, 36, 48

    (a) Group the marks in class intervals 20 – 29, 30 – 39, etc. and then construct the frequency distribution table.

    (b) Draw the histogram for the distribution.

23. (a) Show that $\log \sqrt[3]{x} = \overline{3}.3508$ if $\log x \cong \overline{8}.0524$

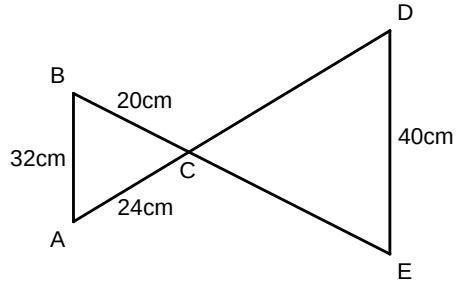
    (b) Use mathematical tables to calculate the following expression and give your answer correct to 3 significant figures

$$\frac{22.8 \times \sqrt{0.0727}}{0.916}$$

24. Use the figure below to:

    (a) Prove that ΔABC is similar to ΔEDC

    (b) Calculate the length of EC and CD.



25. Draw the graph of $y = -x^2 + 4x - 5$ and use it to solve the equation $y = -x^2 + 4x - 5$.

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