THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION AND CULTURE

FORM TWO SECONDARY EDUCATION EXAMINATION, 1983

0041

BASIC MATHEMATICS

TIME: 2½ Hours.

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1. This paper consists of Sections A and B
2. Answer ALL questions in both Sections in the answer sheets provided.
3. In BOTH Sections A and B, ALL WORKING MUST BE SHOWN CLEARLY.
4. Unless stated otherwise, mathematical tables, squared papers and slide rules may be used.

This paper consists of 5 printed pages.

SECTION A

Answer ALL questions in this section. Show ALL WORKING for each question.

1. Find the product of the LCM and GCF of 6, 18 and 28.

2. If x is directly proportional to y and y = 7 when x = 18; Find x when y = 21.

3. If $\underline{a} = 4\underline{i} + 3\underline{j}$ and $\underline{b} = -2\underline{i} + \underline{j}$; Find the value of $4\underline{a} + 3\underline{b}$.

4. Rationalize the denominator of $\frac{(\sqrt{6} + \sqrt{3})}{(\sqrt{6} - \sqrt{3})}$

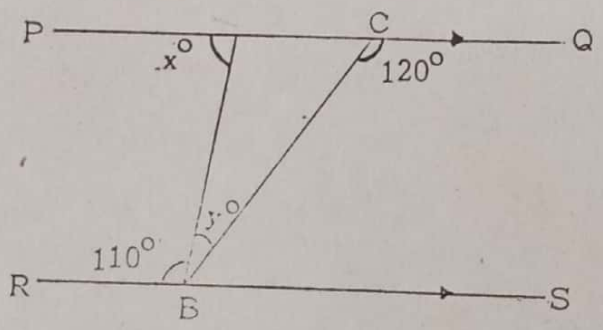
5. Joyce and June divided the profits of their business in the ratio 4:3. If Joyce got 1050/=; What was the total profit?

6. Without using tables, evaluate $(2079)^2 - 2079 \times 2069$.

7. Given that $4x^2 + ax + 9$ is a perfect square, find the possible value of a.

8. If $p*q$ is define by $\frac{1}{2}p - 3q$, find the value of $(2*1) * (4*3)$.

9.



In the above diagram, calculate the value of x and y.

10. Given that $A = \{1, 5\}$ and $B = \{\emptyset\}$, Find
(a) $A \cup B$ (b) $A \cap B$.

11. Solve the equation $2x - 4\left[8 - 3(x + 5)\right] = 0$.

12. Given that $\cos A = 0.6$, where $\hat{A}$ is an acute angle. find, without using tables, $\tan\hat{A}$.

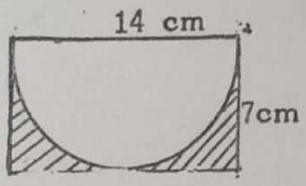
13. Without using tables, find the value of $\log_{12} 144 + \log_5 125 - \log_3 3$.

14. The line joining ~~the~~ the points ~~3,4~~ (3q, 4) and (q, −3) has a gradient of 1. Write down the equation of the line.

15. Find the rational number in the form $\frac{a}{b}$ where a and b are integers and $b \neq 0$ from the number $0.2\dot{3}$.

16. A rectangle measuring 14cm by 7cm has a semicircle which just touches the sides removed as shown in the diagram below. Find the perimeter of the shaded part.

$\left[\pi = \frac{22}{7}\right]$



17. Simplify, correct to 3 significant figures
    (a) 0.000659 + 0.00106 + 0.003407
    (b) 28.243 ÷ 26

18. Solve the simultaneous equations

$$\begin{cases} 3x - 7y = 2 \\ x - 2y = 4. \end{cases}$$

19. Make l the subject of the formula in the formula $T = 2\pi\sqrt{\frac{l^2+3h^2}{3gh}}$

20. If shs.600/= amounts to 960/= for 5 years, what is the percentage rate of simple interest per annum?

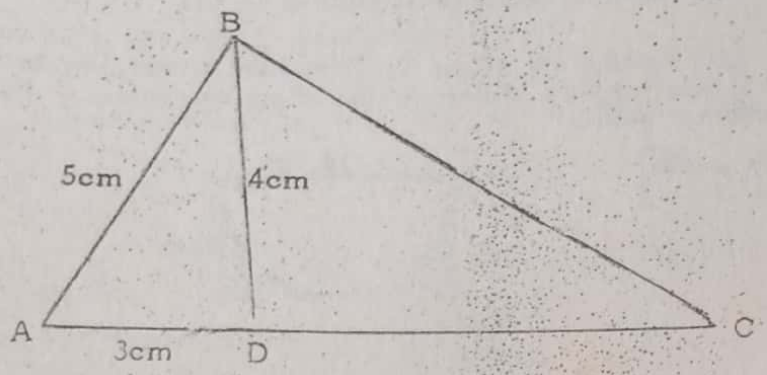
SECTION B

Answer ALL questions in this section.
Show ALL WORKING for each question.

21. A building has an angle of elevation of 35° from point A and an angle of elevation of 45° from point B. If the distance between A and B is 30m, what is the height of the building?

22. (a) Given that $\log_{10} 2 = 0.3010$ and $\log_{10} 3 = 0.4771$, evaluate $\log_{10} 360$.
    (b) Use mathematical tables to find the value of $\frac{(0.3955)^2 \times 431.8}{98.42}$

23.



Using the principle of similar triangles, find the length of $\overline{BC}$ and that of $\overline{DC}$ in the above diagram.

24. (a) The age distribution in a form I class was as follows:

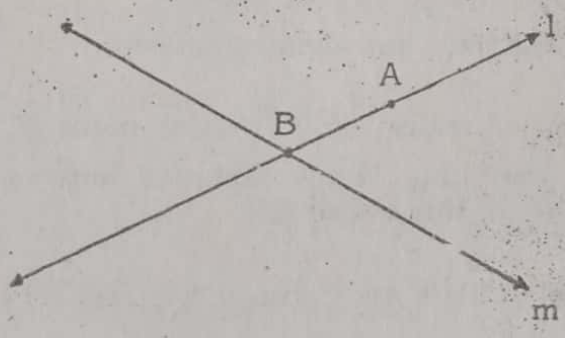
Less than	14	years	= 3
	14 - 15	years	= 20
	16 - 17	years	= 9
More than	17	years	= 4

Show this information on a pie chart.

(b) The scores in a mathematics test were 18, 14, 17, 18, 15, 17 12, 13, 18 and 14. Find the

(i) mean (ii) mode (iii) median.

25. Two lines l and m intercept at point B making an angle of 40°. A is a point on line l such that $\overline{BA}$ = 3 cm (see diagram).



(a) Construct the locus of P such that P has the same distance to l and m

(b) In the same drawing, construct the locus of P such that P has a distance of 2 cm from A.

(c) How many points belong to both loci?