



2025-2026 SECOND TERM EXAMINATIONS

SUBJECT NAME: MATHEMATICS

LEVEL: SENIOR THREE (S3)

EXAMINATION DURATION: 3 HOURS

TOTAL MARKS:/100

INSTRUCTIONS:

- This paper has two sections A and B
- Answer all questions in section A and three questions in section B.
- For the open ended questions, show all the working steps clearly
- Use the graph paper for graphs
- Non programmable calculators and geometrical instruments may be used

Part 1: Multiple choice questions

1. Which trigonometric ratio is defined as opposite side divided by hypotenuse? (3 marks)

- A. Cosine B. Tangent C. Sine D. Cotangent

2. In a right-angled triangle, the median to the hypotenuse is 3.24 cm. What is the length of the hypotenuse? (3 marks)

- A. 3.24cm B. 1.62cm C. 1.8cm D. 6.48cm

3. The simple interest of 16000Frw for 2 years 10% p.a is: (3 marks)

- a. 3300 Frw B. 3200 Frw C. 2300 Frw D. 1600 Frw

4. If a line has slope 3 and pass through point (1, 2) then the equation of line is: (3 marks)

- A. $y = 3x - 1$ B. $x = 3y + 1$ C. $y = 3x + 1$ D. $x = 3y - 1$

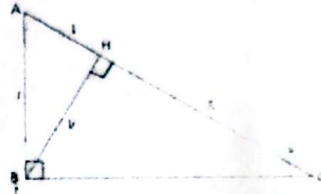
5. Choose the best answer for the values of x and y . (3 marks)

(a) $x = 6$ and $y = 3\sqrt{5}$

(b) $x = 3\sqrt{5}$ and $y = 2\sqrt{5}$

(c) $x = 6$ and $y = 3$

(d) $x = 6$ and $y = 2\sqrt{5}$



6. The accumulated amount given by \$2000 at 10% p.a for 1 year compounded half-yearly is:

- A. \$200 B. \$205 C. \$210 D. \$2420 (3 marks)

7. A number when multiplied by 3 and then reduced by 7 gives 20. What is the number?

- A. 10 B. 9 C. 11 D. 12 (3 marks)

8. For which value of x is the expression $\frac{2x}{3x-12}$ undefined? (3 marks)

- A. 0 B. 3 C. 4 D. 12

9. If the straight lines $x - 2y + 5 = 0$ and $kx + 6y - 9 = 0$ are parallel to each other, then the value of k is:

- A. -3 B. 12 C. 6 D. 14 (3 marks)

10. If $y = x$ and $y = -mx$ are perpendicular, then the value of m is:

- A. 1 B. $-\frac{1}{2}$ C. 0 D. -1 (3 marks)

Part 2: Open-ended questions

11. Uwase bought 4 pens and 3 books altogether at 1350 Frw. At the same market, she bought 2 books and a pen altogether at 650frw. Find the cost of one book and that of one pen. (3 marks)

12. (a) Find the base n if $103_n + 26_n = 131_n$. (3 marks)

(b) Given the number bases $A = 154_9$ and $B = 1101_2$, find $(A + B)_7$. (3 marks)

13. (a) Sixteen men dig a trench of 92m long in 9 days. What length of trench can 12 men dig in 15 days? (2marks)

(b) An author earned a royalty of 880,250 RWF before an advance tax was deducted. If the tax was charged at rate of 20%, calculate:

i. The tax he was charged. (2marks)

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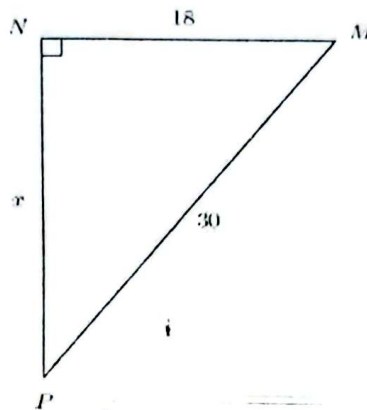
ii. His earning after the tax.....

..... (2marks)

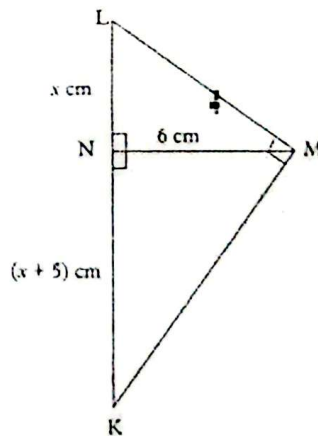
14. a) Factorize and simplify: $\frac{2x^2-4x}{x^2-4} \cdot \frac{x+2}{x-1}$ (3 marks)

b) Without using calculator, work out $\frac{4.5^2-2.5^2}{3.5}$ (2 marks)

15. a) The diagram shows the right-angled triangle MNP. Find the value of x . (2marks)



b) Find the value of x in triangle KLM below given that $KM = (x + 5)$ cm, $NL = x$ cm and $NM = 6$ cm. (3marks)



SECTION B: Answer only three questions of your choice

(45marks)

16. a) If you deposit 4,000 FRW into an account that pays 6% annual interest, compounded quarterly, how much money will be in the account after 5 years? (5marks)
- b) Twelve men, working 8 hours a day, can complete a piece of work in 15 days. How many hours per day must 20 men work to finish it in 8 days? (5marks)
- c) Last year, 480,000 tickets were sold for a tennis tournament. This represented 80% of all available tickets. Calculate the total number of tickets that were available for the tournament. (5marks)

17. A group of 50 people were asked about the sections they read very keenly in a newspaper among politics (P), advertisements (A) and sports (S). The results showed that 25 read politics, 16 read advertisement, 14 read sports. 5 read politics and advertisement, 4 read advertisement and sports, 6 read both politics and sports, and 2 read all the three sections.

- i) Represent the data on the Venn diagram. (8marks)
- ii) Find the number of people who read at least one of the three sections. (3marks)
- iii) Find the number of people who read only one of the three sections. (2marks)
- iv) Find the number of people who read none of the three sections. (2marks)

18. Given the function defined as follow $y = x^2 + 4x + 3$ for $-4 \leq x \leq 0$.

a) Complete the following table:

(5marks)

x	-4	-3	-2	-1	0
y					

- b) Find the coordinates of its vertex (1 mark)
- c) Find its y-intercept (1mark)
- d) Find its x-intercepts (2 marks)
- e) Find the equation of the axis of symmetry (2 marks)
- f) Plot the graph of this function. (4marks)

19. By shading the unwanted regions, show the regions which satisfy the given system of inequalities:

$$\begin{cases} y \geq 0 \\ x \geq 0 \\ 2x + 3y \leq 6 \end{cases}$$

(15marks)

20. Given that $P(x) = 2x^3 + 11x^2 + 17x + 6$

- a) Show that $x + 2$ is a factor of $P(x)$. (3marks)
- b) Factorize completely $P(x)$. (8marks)
- c) Solve for x the equation $P(x) = 0$ (4marks)

END

