

R&PUBLIC OF SOMALILAND

FORM FOUR EXAMS, 2023

MATHEMATICS
PAPER TWO



NATIONAL EXAMINATION BOARD



OK



SOM EXAMS

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Total Score

Name.....

School

Roll No

Republic of Somaliland

Somaliland National Examination Board

Form Four

MATHEMATICS

PAPER TWO

2022 - 2023

TIME 2 HOURS

Plus 10 minutes for reading through the paper

INSTRUCTIONS TO CANDIDATES

This paper consists of 10 printed pages.
Count them now. Inform the invigilator if there are any pages missing.

PART 1:	20 Multiple Choice Questions	40 Marks
PART 2:	10 Structured Questions	60 Marks

TOTAL 100 Marks

- Answer ALL questions in Part 1 and 2.
- Extra papers and Mobiles are Not Allowed.

PART ONE: 20 MULTIPLE CHOICE QUESTIONS

(40 marks).

Circle the correct answer only.

- $\int \left(\frac{1}{3}x^2 + 2x + 5\right)dx$ is :
A. $\frac{2}{3}x + 2 + c$ B. $\frac{x^3}{2} + 2x^2 + 5 + c$ C. $x^3 + 2x^2 + 5x + c$ D. $\frac{x^3}{9} + x^2 + 5x + c$
- $3 \cos 2\pi - \sin \frac{\pi}{2} + 2$ is :
A. 1 B. -1 C. 0 D. 2
- If $\cos A = \frac{8}{17}$ then $\sin 2A$ is :
A. $\frac{4}{5}$ B. $\frac{240}{289}$ C. $\frac{15}{17}$ D. $\frac{12}{13}$
- For the function $f(x) = x^2 + 4x + 2$, the point $(-2, -2)$ is:
A. Maximum point B. Minimum point C. Stationary D. Inflection point
- $\sin 135^\circ$ is :
A. $\frac{1}{2}$ B. $\frac{\sqrt{3}}{2}$ C. $\frac{-\sqrt{2}}{2}$ D. $\frac{-\sqrt{2}}{2}$
- If $f(x) = \frac{1}{2}x^2 + 2x + 5$ then the equation of tangent line at $x = 2$ is:
A. $Y = 4x + 11$ B. $Y = 4x$ C. $Y = 4x$ D. $4x + 19$
- The inter-quartile range for the data set 11, 3, 5, 8, 10, 9, 4 is :
A. 4 B. 5 C. 6 D. 10
- A bag contains 3 black, 4 red and 6 white marbles, one marble is drawn at random.
What is the probability that the marble is red?
A. $\frac{4}{13}$ B. $\frac{6}{13}$ C. $\frac{3}{13}$ D. $\frac{13}{6}$
- The math test score are 50, 55, 60, 65, 67, 70, 73, 75, 80 and 85. The percentile ranking of 70 is:
A. 45 B. 50 C. 60 D. 55

10. The third term of $(x + y)^6$ is :

- A. x^5y B. $6x^5y$ C. $15x^4y^2$ D. $20x^3y^3$

11. Given that $Z_1 = 3 + 2i$ and $Z_2 = 4 - 2i$, then $Z_1 \cdot Z_2$ is :

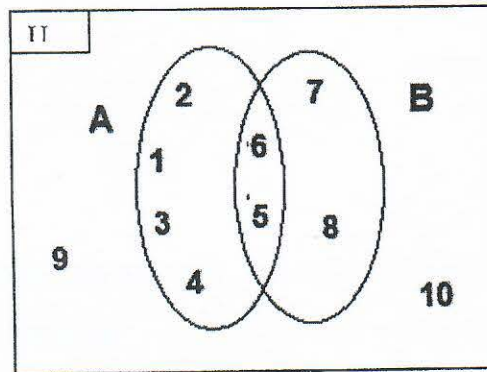
- A. $12 + 2i$ B. $16 + 2i$ C. $8 + 2i$ D. $10 + 2i$

12. Convert $4 [\cos 210^\circ + i \sin 210^\circ]$ into rectangular form :

- A. $-2\sqrt{3} + 2i$ B. $2\sqrt{3} + 2i$ C. $2\sqrt{3}$ D. $-2\sqrt{3} - 2i$

13. For the diagram shown below find $\overline{A \cup B}$

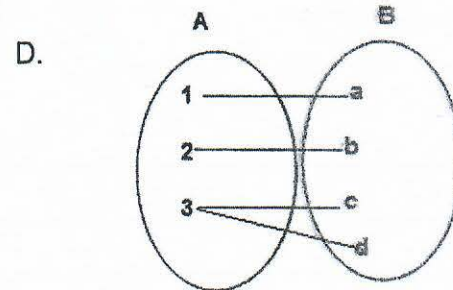
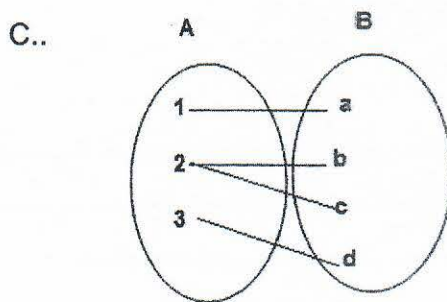
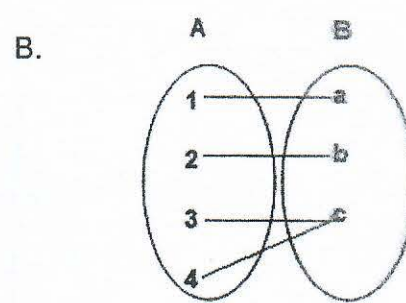
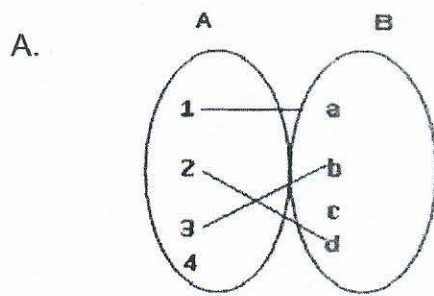
- A. $\{5, 6\}$
B. $\{1, 2, 3, 4\}$
C. $\{7, 8\}$
D. $\{9, 10\}$



14. The equation of a parabola whose focus and directrix are $F(6, 0)$ and $x = -6$ is :

- A. $x^2 = 24y$ B. $y^2 = 24x$ C. $x^2 = -24y$ D. $y^2 = -24x$

15. Which of the following relations is a function?



16. The mode of this set of data 5, 6, 6, 7, 8, 9, 8, 7, 8, 8, 7 is:

- A. 6 B. 7 C. 8 D. 9

17. If set A { 1, 2, 3, d, f, k } the number of subsets of set A (power set A) is

- A. 8 B. 16 C. 32 D. 64

18. The series $1 + 3 + 5 + 7 + \dots$ the sum of first 21 terms is:

- A. 440 B. 441 C. 484 D. 483

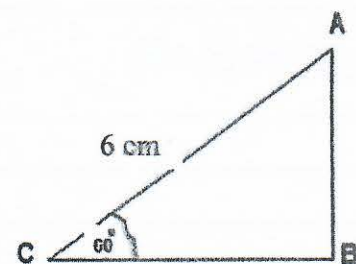
19. The line that passes through the points (2, 4) and (3, - 4). Then the y - intercept is :

- A. 16 B. 20 C. -14 D. 4

20. From the diagram side BC is:

Given: $\cos 60^\circ = \frac{1}{2}$

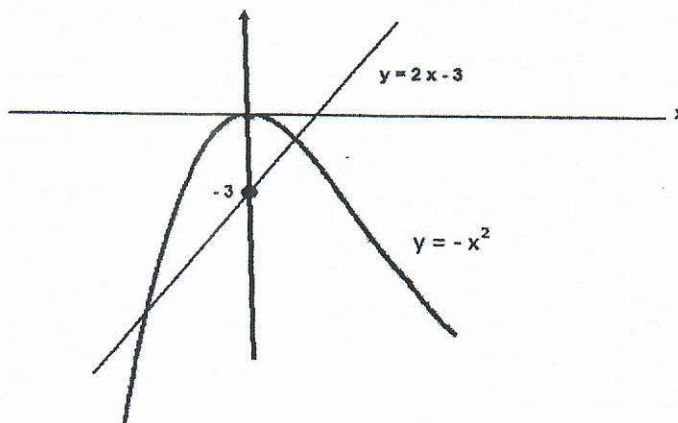
- A. 2 B. 3
C. 4 D. 5



PART 2: STRUCTURED QUESTIONS. ANSWER ALL QUESTIONS..

(60 Marks)

Q1. Find the area between the curve $y = -x^2$ and the line $y = 2x - 3$ (6 marks)



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Q2. If $\sin A = \frac{3}{5}$ and $\cos B = \frac{5}{13}$. Evaluate

a) $\sin (A - B)$ (3 marks)

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b) $\cos (A + B)$ (3 marks)

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Q3. Solve

$$2 \cos^2 x + 3 \cos x - 2 = 0 \text{ for } 0^\circ \leq x \leq 360^\circ$$

(6 marks)

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Q4. If $Z = 2 [\cos 30^\circ + i \sin 30^\circ]$

Find

a) Z^3

(3marks)

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b) Z^5

(3 marks)

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Q5. A bag contains 6 red balls, 4 blue balls and 5 white balls. Two balls are drawn one after the other, without replacement.

a) Find the probability that both are white (3 marks)

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b) Find the probability that both are red (3 marks)

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Q6. A particle is moving in a straight line and its distance, in meters, from a fixed point in the line after t seconds is given by the equation $s(t) = t^3 - 6t^2 + 8$

a) Find the Acceleration of the particle after 3 second. (2 marks)

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b) When does the velocity equal 36 meter per seconds? (2 marks)

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c) When the particle is at rest? (2 marks)

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Q7. If $f(x) = 2x + 1$ and $g(x) = 4x^2 + 2x - 1$

a) $(f + g)(x)$ (2 marks)

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b) $(f \circ g)(x)$ (2 marks)

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c) $(f \circ g)(2)$ (2 marks)

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Q8. The equation of a parabola is $y^2 + 8y + 8x - 8 = 0$

Compute the

a) Vertex (2 marks)

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b) Focus (2 marks)

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c) directrix (2 marks)

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Q9. The sum of first and 3rd terms of an arithmetic progression is 10, and the sum of 2nd and 5th terms of a arithmetic progression is 19 .

Find the

a) first term (2 marks)

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b) difference (2 marks)

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c) sum of the first 25 terms (2 marks)

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Q10.

a) Aisha's salary is \$ 600 a month. Her salary is increasing 6%. Workout her new salary? (3 marks)

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b) A dress which was costing sh 700,000 rises to sh 850,000. What was the percentage increase of the dress? (3 marks)

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