R&PUBL IC OF SOMALILAND

FORM FOUR EXAMS, 2022

MATHEMATICS

2022

NATIONAL EXAMINATION BOARD

SomExams

Total score

Name ……..

School……..

Roll No……

Republic of Somaliland

Somaliland National Examination Board

Form Four

MATHEMATICS

PAPER ONE

June 2022

TIME 2 HOURS

Plus 10 Minutes for reading through paper

INSTRUCTIONS TO CANDIDATES

This paper consists of 12 printed pages.

Count them now. Inform the invigilator if there are any pages missing.

PART 1: 20 MULTIPLE CHOICE QUESTIONS	40 MARKS
PART 2: SRTUCTURES QUESTIONS	60 MARKS
TOTAL	100 MARKS

- Answer ALL questions in part 1 and 2
- All answers must be written on this paper in the spaces provided immediately after each question. Only write on this exam paper

Use this page for rough work. It will <u>NOT</u> be marked.

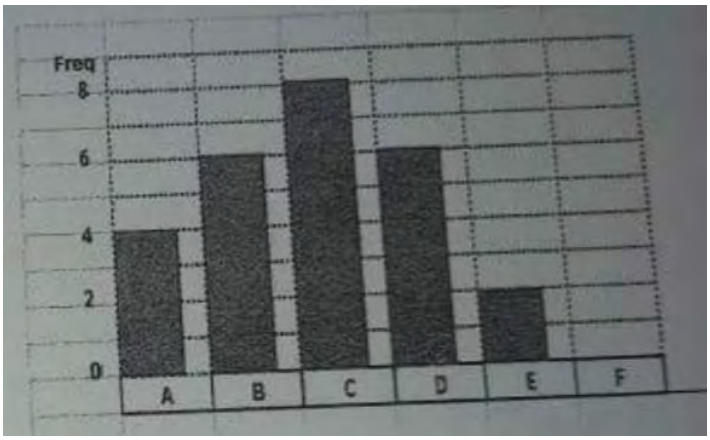
PART ONE: Multiple choice

Choose the correct answer. Answer ALL the questions. Each question carries 2 marks.

1. Convert $\frac{4}{3}\pi$ to degrees:

   A. 120^0
   B. 60^0
   C. 240^0
   D. 300^0

2. The marks obtained by a class of 26 students In a maths test are shown below what is the mode



   A. B
   B. F
   C. A
   D. C

3. The derivative of sinx is
   A. Cos x
   B. –cos x
   C. Sec x
   D. Tan x

4. Evaluate ${}_6C_4$:

   A. 120
   B. 60
   C. 30
   D. 15

5. What is the conjugate of -3i + 4 ?

   A. 3i – 4
   B. -3i – 4
   C. 4 + 3i
   D. 4 – 3i

6. If the equation of the curve y = 4x -$\frac{x}{3}3$, calculate the gradient of the curve at x=3:
   A) -5
   B) 5
   C) 9
   D) -9
7. An ordinary die is thrown once what is the probability of getting even number ?

   A) $\frac{1}{6}$
   B) $\frac{1}{2}$
   C) $\frac{2}{3}$
   D) $\frac{1}{3}$

8. Evaluate the $\lim_{x\to\infty} \frac{4x^3 - 1}{5x^2}$

   A) $\frac{5}{4}$
   B) $-\frac{4}{5}$
   C) $\frac{3}{5}$
   D) $\frac{4}{5}$

9. if $2\sin^2 x - \sin x = 0$ solve x for for the range of $0^0 < x < 180^0$:

   A. 0^0 , 30^0
   B. 30^0 , 150^0
   C. 0^0 , 180^0
   D. 180^0 , 360^0

10. Integrate $\int (3x^2 + 4x - 5)\, dx$

A) $X^3 + 2x^2 - 5x + c$

B) $X^3 + 2x^2 - 5x + c$

C) $X^3 + 2x^2 - 5x + c$

D) $X^3 + 2x^2 - 5x + c$

11. Which one of the following expressions is the same as cos2A >

A) $Cos^2 + sin^2 A$

B) 1

C) $2cos^2 A + 1$

D) $2cos^2 A + 1$

12. Compute the interquartile range for the data set 6 , 12 , 13 , 9 , 3 , 10 and 4

A) 6
B) 4
C) 8
D) 16

13. Find the value of X and Y that makes the equation 5x + 3y i = 10 – 9i true

A) (-2 , -3)
B) (-2 , 3)
C) (-3, 2)
D) (-2 , -3)

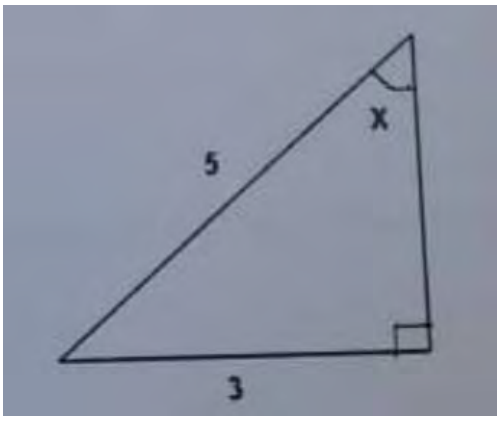
14. Given the sin A = $\frac{3}{5}$ and A is an acute angle , calculate sec A ?

A) $\frac{-3}{4}$

B) $\frac{4}{5}$

C) $\frac{5}{3}$

D) $\frac{5}{4}$



15. The ages of 10 pupils on a primary class is given below :
    12 , 8 , 10 , 8, 9 , 10 , 11 , 9 , 8 , 9 what is the mean age of pupils
    A) 11
    B) 10
    C) 12
    D) 8
16. Change 540^0 to π radians
    A) 3 π
    B) 4 π
    C) $\frac{3}{2}$ π
    D) $\frac{3}{4}$ π
17. If 8 people can clean the school in 6v hours how many people are needed to clean the school in 4 hours
    A) 5
    B) 3
    C) 12
    D) 8
18. Find the equation of the circle shown below
    A) $X^2 + Y^2 = 15$
    B) $X^2 + Y^2 = 25$
    C) $X^2 + Y^2 = 5$
    D) $X^2 + Y^2 = 125$
19. Evaluate $\log_2 \frac{1}{8}$
    A) -2
    B) +2
    C) +3
    D) -3
20. Calculate the area of parallelogram ABCD shown below given that AB=CD
    A) $205cm^2$
    B) $250cm^2$
    C) $200cm^2$
    D) $125cm^2$

Part Two: 6 Structured Questions (60 marks)

1. Evaluate the following

a) $\lim_{x \to 2} 3x + 9$ (2 marks)

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b) $\lim_{x \to 5} \frac{x^2 - 25}{x + 5}$

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c) $\int_1^3 (3x^2 - 4x + 5)dx$

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2. Convert each of the following radiant to degrees

a) $\frac{3}{4}\pi$ (2 mark)

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b) $\frac{5}{3}\pi$ (2 mark)

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c) $\frac{\pi}{6}$ (2 mark)

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3. A box contain 3 red, 2 blue and 5 white marbles. A marble is drown at random from the box what is the probability of getting :
   a) A red marble

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   b) A blue marble

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   c) A red or blue marble

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   d) Neither blue or red marble

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4. Integrate each of the following
   a) $\int 2x\ dx$

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   b) $\int \sin 4x\ \ dx$

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   c) $\int -\frac{3}{x^2}$

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5. Simplify each of the following

a) $\sqrt{109}$ (2 mark)

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b) (-8 + 5i) + (6 – 3i)

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c) (3 + 2i) (3 - 2i)

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6. **Table below shows the marks obtained by 30 students in class**

score	Mid – mark (x)	Freq (f)	fx
0 -9		**4**	**18**
10 – 19	**4.5**	**6**	
20 – 29		**10**	
30 – 39	**34.5**	**8**	**276**
40 - 49		**2**	
Total		$\sum f = 30$	$\sum fx =$

a) Complete the table (3 mark**)**

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b) Calculate the estimate mean mark (3 mark

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7. Find the derivative of the following

a) $Y = x^3 + x^2 - 1$

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b) $Y = x^2 (x^3 – 1)$

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c) y= tan x

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8. **prove the following identities**

a) $\frac{\boldsymbol{sin\ 2x}}{\boldsymbol{1-cos\ 2x}}$ = cot x (3 mark)

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b) $\text{Sec}^4 \emptyset - \sec^2 \emptyset = \tan^4 \emptyset + \tan^2 \emptyset$

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9. If f(X) = 3x+1 and g(x) 2x-1 find

a) f(2)

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b) g(- 3)

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c) f(2) - f(-3)

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d) $g^{-1}(x)$

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END