R&PUBL IC OF SOMALILAND

FORM FOUR EXAMS, 2018

MATHEMATICS

2018

NATIONAL EXAMINATION BOARD

SomExams

Total Score

Name.....

School .....

Roll No .....

Republic of Somaliland

Somaliland National Examination Board

Form Four

MATHEMATICS PAPER TWO

(EXTENDED MATHEMATICS)

June 2018

TIME 2 HOURS

Plus 10 minutes for reading through the 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:	10 Structured 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. Only write on this exam paper.

Use this page for rough work. It will NOT be marked.

PART 1: 40 marks. Answer ALL the questions. Each question carries 2 marks.

Circle the correct answer. For each question there is only one correct answer

1. Simplify the expression $3(x + 1) - 2(3x + 7)$.

   A. $-3x - 11$ B. $-3x - 10$ C. $-3x - 8$ D. $-3x + 17$

2. 15% of 1080 is :

   A. 161.20 B. 162 C. 322.40 D. 3224

3. If $\frac{x-1}{3} = \frac{2}{3}$, then solve for x:

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

4. $\sqrt[4]{81}$ is equal to

   A. 2 B. 4 C. 3 D. 9

5. If $f(b) = (-b)^5 - \frac{3}{8}b$ the value of f(–2) is equal to

   A. 34 B. 38 C. 44 D. 42

6. In a single throw of two dice, the probability of getting a total of 9 is :

   A. 1/6 B. 1/9 C. 1/36 D. 1/12

7. The value of ${}^{11}C_3$ is equal to

   A. 990 B. 165 C. 175 D. 99

8. The median of this data 2, 3, 1, 6, 4, 5, 7 is

   A. 3 B. 5 C. 4 D. 6

9. A pair of shoes is priced at \$45. During a sale the price is reduced by 20%. Calculate the sale price of the shoes.

A. \$36 B. \$24 C. \$ 50 D. \$12

10.

For the right angled triangle shown above, the value of $\sin\theta$ is:

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

11. The gradient of the tangent to the curve $y = x^2$ at the point (2, 4) is:

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

12. Convert 60^0 into radian:

A. $\frac{\pi}{5}$ B. $\frac{2\pi}{3}$ C. $\frac{\pi}{3}$ D. $\frac{\pi}{2}$

13. The value of $\frac{\log 8}{\log 2}$ is equal to:

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

14. Simplify $(3i - 5) + (i + 8)$

A. $2i + 13$ B. $3i^2 - 3$ C. $4i + 3$ D. $3i + 3$

15. If f(x) $3x + 2$ and g(x) $= 2x - 1$, then $fg(x)$ is equal to:

A. $6x - 3$ B. $6x - 1$ C. $6x + 3$ D. $6x$

16. If $y = 3x^2 + 3x - 6$, then $\frac{dy}{dx} =$

A. 6x-6 B. 6x+3 C. $x^3 + 3x$ D. 6x+3x-6

17. Convert $\frac{2\pi}{3}$ radian into degree:

A. 240^0 B. 120^0 C. 80^0 D. 150^0

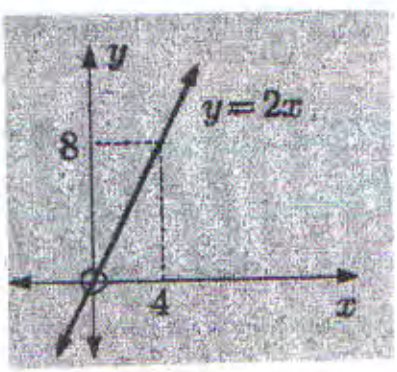
18. The stationary point on the curve $y = x^2 - 6x + 8$ is:

A. (3, 2) B. (2, 1) C. (3, -1) D. (4, 5)

19. The product of $(3i + 2)$ and $(2i + 3)$ is:

A. $14i - 3$ B. $13i$ C. $16i + 5$ D. $14i$

20.



Find the area of the region enclosed by $= 2x$, *the* $x -$ *axis,* $x = 0$ *and* $x = 4$.

A. $16 units^2$ B. $8 units^2$ C. $5 units^2$ D. $4 units^2$

PART 2: ANSWER ALL QUESTIONS. (60 MARKS)

1. A trader bought 360 eggs at sh.5 each and sold them at sh.6 each.
   a) Calculate the profit he made on the sale. (3marks)

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   b) Find his percentage profit. (3marks)

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2. Find

   a) $\lim_{x \to 2} \frac{x^2 + x - 6}{x - 2}$ (3 marks)

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b) Evaluate $\lim_{x \to 2} \frac{x^2 - 9}{x - 3}$ (3 marks)

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3. A curve has equation $y = 2x^3 + 3x^2 - 36x + 1$

a) Find the gradient of the curve at x = 0 (2 marks)

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b) Find the coordinates of maximum and minimum points (4 marks)

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4. If α *and* β are acute angles such that $Sin\alpha = \frac{12}{13}$ and $Cos\beta = \frac{4}{5}$ without using a calculator or tables

a) Find $\sin(\alpha + \beta)$ (4marks)

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b) Find $\cos(\alpha - \beta)$ (2marks)

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5. a) A small company makes a profit of $8000. This is divided between the directors: Ahmed, Amina and Osman in the ratio 7:5:4 respectively. How much money will Amina receive? (3 marks)

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b) The weight of 10 form four students were found to be 55, 62, 51, 49, 65, 59, 67, 60, x , 61. If their mean was 59, find the value of x. (3 marks)

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6. If $f(x) = 3x + 2$ and $g(x) = \frac{x+5}{3}$:

a) Evaluate $f(4)$

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(2marks)

b) Find $f^{-1}(8)$

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(3 marks)

c) Find $fg(x)$

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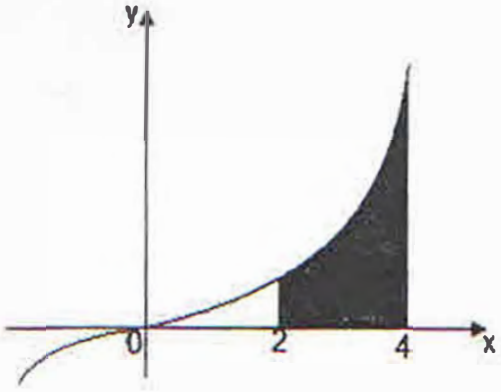
(3marks)

7. Find the area bounded by the $x-axis$, x = 2, x = 4 and the curve $y = x^3 + x$. (4 Marks)



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8. Evaluate $\int_2^3 (3x^2 - 2x + 1)dx$ (6 Marks)

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9.a) The parallel sides of a trapezium are 13cm and 11cm. if the area of the trapezium is 84cm^2. Calculate the height of the trapezium. (3 Marks)

b).Prove the following identity: $\tan^2\theta - \sin^2\theta = \tan^2\theta \sin^2\theta$ (3 Marks)

10. An aircraft has 120 seats for passengers. The number of seats occupied during 100 flights is given below

Number of seats	Frequency	Mid-point x	fx
100-104	15		
104-108	18		
108-112	34		
112-116	16		
116-120	17		
	$\Sigma f =$		$\Sigma fx =$

a) Complete the table (2 Mark)
b) Which is the modal class? (1 mark)
c) Calculate the mean seats (3 Mark)