

FEDERAL REPUBLIC OF SOMALIA

GRADE 12 EXAMS, 2018

MATH



OFFICE OF EXAMINATIONS AND CERTIFICATION



Name.....

School

Roll Number.....

Somali Federal Ministry of Education, Culture & Higher Education

Form Four National Standardized Examinations.

MAY / JUNE 2018

MATHEMATICS EXAMINATION

TIME 2 HOURS

INSTRUCTIONS:

- This paper consists of 12 printed pages
- There are 2 sections.
 - ⇒ **PART 1: 20 Multiple Choice Questions** (40 marks)
 - ⇒ **PART 2: 12 Structured Questions** (60 marks)
 - TOTAL** (100 marks)
- Answer all questions in the spaces provided
- No extra paper is allowed

PART 1: 20 MULTIPLE CHOICE QUESTIONS. Answer all questions. Circle the correct answer only (40marks)

1. $\cos(A+B)$ is equal to

- a) $\cos A \cos B - \sin A \sin B$
- b) $\cos A \cos B + \sin A \sin B$
- c) $\sin A \cos B + \cos A \sin B$
- d) $\sin A \cos B - \cos A \sin B$

2. If $\cos \theta = \frac{5}{13}$, then $\sin \theta =$

- a) $\frac{5}{12}$
- b) $\frac{12}{5}$
- c) $\frac{13}{12}$
- d) $\frac{5}{13}$

3. $\sin 135^\circ$ is equal to

- a) $\frac{1}{2}$
- b) $\frac{\sqrt{2}}{2}$
- c) $\frac{-\sqrt{2}}{2}$
- d) $\frac{-\sqrt{3}}{2}$

4. $\sec \beta$ is equal to

- a) $\frac{1}{\cos \beta}$
- b) $\frac{1}{\sin \beta}$
- c) $\frac{1}{\operatorname{cosec} \beta}$
- d) $\frac{1}{\tan \beta}$

5. $(2+i) + (3-i)$ is equal to

- a) 6
- b) $5+2i$
- c) 5
- d) $6-i^2$

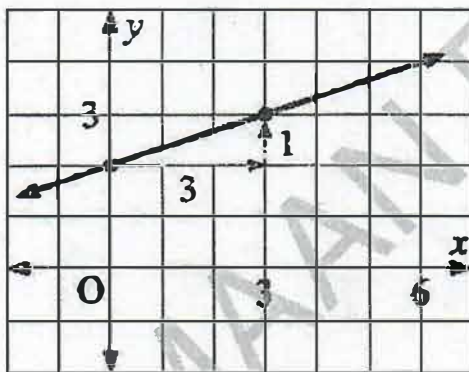
6. $\frac{3}{2+3i}$ is equal to

- a) $\frac{3}{2+3i}$ b) $\frac{6}{13} + \frac{9i}{13}$ c) $6+9i$ d) $\frac{6}{13} - \frac{9}{13}i$

 7. $\left(\frac{1}{2}+i\right)\left(-\frac{1}{2}-i\right)$ is equal to

- a) $\frac{1}{4}-i^2$ b). $\frac{1}{4}+i^2$ c). $\frac{1}{4}i^2$ d). $i^2+\frac{1}{4}$

8.



Using the diagram shown above, find the equation of the line.

- A. $y = 3x + 2$ B. $y = x - 2$ C. $y = \frac{1}{3}x + 2$ D. $y = \frac{1}{4}x + 5$

 9. C_2^3 is equal to

- a) 3 b) 3i c) 8 d) 10

10. The median of the following set of data is: 33, 30, 31, 32, 38, 37, 35, 39, 36.

- a) 34 b) 31 c) 33 d) 35

11. Simplify $\frac{\sqrt{1-\cos^2\theta}}{\cos\theta}$

- a) $\frac{\cos\theta}{\sin\theta}$ b) $\frac{\sin\theta}{\cos\theta}$ c) $\frac{\csc\theta}{\sin\theta}$ d) $\frac{\sec\theta}{\csc\theta}$

12. The mean of four numbers is 12 and the mean of three number is 13 what is the fourth number?

- a) 9 b) 18 c) 16 d) 24

13. The derivative of $y = 3x^2$ is

- a) $6x^2$ b) $5x$ c) $6x$ d) $3x$

14. If $f(x) = \frac{2x+3}{6}$, then $f(2)$ is

- a) 1 b) $\frac{2}{5}$ c) $\frac{6}{7}$ d) $\frac{7}{6}$

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

- a) $6x - 6$ b) $6x + 3$ c) $x^3 + 3x$ d) $6x + 3x - 6$

16. $\int (2x^2 + 4x + 5) dx$ is

- a) $2x^3 + 4x^2 + 5x$ b) $4x+4$ c) $\frac{2}{3}x^3 + 2x^2 + 5x + c$ d) $2x^2 + 4x + 5$

17. The derivative of $\frac{1}{x^2}$ is

- a). $-\frac{2}{x^3}$ b). $\frac{2}{x^3}$ c). $2x^3$ d). $6x^2$

18. The truth of the statement is if $3+5=8$ then $8+14=16$

- a) F b) T c) TT d) TF

19. Evaluate $\lim_{x \rightarrow -1} (x-1)$

- a) 1 b) -1 c) 0 d) -2

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

- a) $\frac{1}{6}$ b) $\frac{1}{9}$ c) $\frac{1}{36}$ d) $\frac{1}{12}$



Part 2: Answer ALL Questions (60 marks)

1. Find the area of a triangle whose sides are: $a= 5\text{cm}$, $b=3\text{cm}$, $c= 4\text{cm}$.

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..... (3 marks)

2. Show that: $1 + \sin 2\theta = (\sin \theta + \cos \theta)^2$.

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..... (3 marks)

3. Find the exact value of $\sin 75^\circ$

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..... (4 Marks)

4. Solve for complex number solutions: $3x^2 + 2x + 5 = 0$

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..... (3 Marks)

5. Find the quotient $\frac{Z_1}{Z_2}$ of the complex numbers $Z_1 = 24(\cos 300^\circ + i\sin 300^\circ)$ and

$$Z_2 = 8(\cos 75^\circ + i\sin 75^\circ)$$

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 (4 Marks)

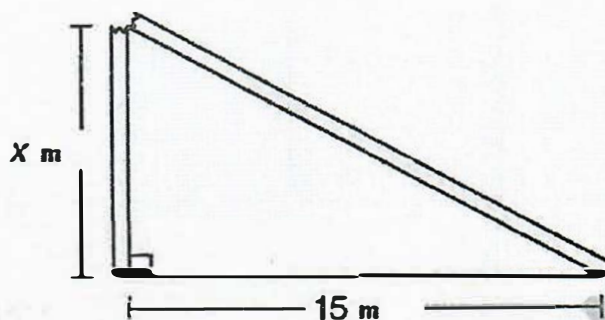
6. A student sat for Physics and Mathematics papers. Let PM denote "Passing Mathematics" and PP denote "Passing Physics", FM denote "Failing Mathematics" and FP denote "Failing Physics". Let the Mathematics test be the first activity and Physics be the second activity. Draw a tree diagram showing the possible outcomes of the two sets. (3 Marks)

7. Evaluate $\int_0^1 (3x^2 + 5) dx$

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 (3 Marks)

11. A wooden pole was broken by wind. Before it broke, the total height of the pole above the ground was 25 m. After it broke, the top of the pole touched the ground 15 m from the base as shown in the diagram. How tall was the part of the pole that was left standing shown by x ?



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 (3Marks)

12. Evaluate $\int \left(\frac{2x+1}{x^4} \right) dx$

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 (4 Marks)

13. For the grouped data

Number of plants	Frequency	Mid pint x	fx
10-14	8		
14-18	10		
18-22	20		
22-26	7		
26-30	5		
	$\Sigma f =$		$\Sigma fx =$

- a) State the upper class limit of the first class interval..... (1 mark)
- b) The lower class boundary of the last class interval.....(1 Mark)
- c) The class size (1 Mark)
- d) Complete the table to show the mid-points, fx , $\Sigma f =$ and $\Sigma fx =$ (4 marks)
- e) Which is the modal class(1mark)
- f) Calculate the mean (2 marks)

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14. Find the limit. $\lim_{x \rightarrow -3} \frac{x^2 + x - 6}{x + 3}$ (3 Marks)

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15. For the data: 12, 17, 6, 9, 8, 9, 16, 15, 10 (6 Marks)

Find:

i). The 1st Quartile (lower quartile)- Q_1

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ii). The 2nd quartile (median)- Q_2

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iii). The 3rd Quartile (Upper quartile)- Q_3

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iv). Range

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v). Interquartile range

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vi). Quartile deviation.

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END