

FEDERAL REPUBLIC OF SOMALIA

GRADE 12 EXAMS, 2022

MATH



OFFICE OF EXAMINATIONS AND CERTIFICATION



Somali Federal Ministry of Education, Culture & Higher Education

Form Four National Standardized Examinations.

MAY / JUNE 2022

SUBJECT: MATH

TIME 2 HOURS

INSTRUCTION: Answer all questions in the ANSWER BOOKLET**Part one: Circle the letter of the correct answer (50 marks)**1. $\cos A \cos B - \sin A \sin B$ is

- A.
- $\sin(A + B)$
- B.
- $\cos(A + B)$
- C.
- $\cos(A - B)$
- D.
- $\sin A \cos B$

2. The exact value of $\cos 30^\circ$ By using half angle formula is

- A.
- $\frac{2}{\sqrt{3}}$
- B.
- $\frac{\sqrt{2}}{2}$
- C.
- $\frac{1}{2}$
- D.
- $\frac{\sqrt{3}}{2}$

3. The probability of failing exam is $P(F) = 0.1$, then the probability of passing exam is

- A. 0.8 B. 0.9 C. 0.7 D. 0.6

4. The number of ways that five textbooks can be arranged on a shelf is

- A. 140 B. 120 C. 130 D. 150

5. The imaginary part of the complex number $z_1 = 2 + 3i$ is

- A.
- $\text{Im}(z) = 2$
- B.
- $\text{Im}(z) = 3i$
- C.
- $\text{Im}(z) = i$
- D.
- $\text{Im}(z) = 3$

6. If $z_1 = 2 - 5i$ and $z_2 = 1 + 4i$ then the addition of z_1 and z_2 is

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

7. The marks of Maryam of six subjects in standard eight class was 24, 26, 35, 28, 50, 14 The range is

- A. 16 B. 36 C. 18 D. 34

8. If the variance of a data was 49, then the standard deviation is

- A. 49 B. 48 C. 7 D. 6

9. The exact value of $\lim_{x \rightarrow 0} 18$ equals

- A. 0 B. 1 C. 180 D. 18

10. The exact value of this $\lim_{x \rightarrow -\infty} \left(2 - \frac{1}{x}\right)$ will be:

- A. 1 B.
- $\frac{1}{2}$
- C. 2 D. -2

11. If a given function of $y = 6x^2 - 8x + 1$ then $\frac{dy}{dx}$ is

- A. $\frac{dy}{dx} = 12x + 8$ B. $\frac{dy}{dx} = 12x - 8$ C. $\frac{dy}{dx} = 12x^2 + 8$ D. $\frac{dy}{dx} = 12x$

12. The derivative of 40

- A. 40x B. 40x + c C. 0 D. -40

13. The integration of $\int 2dx$ is equal

- A. 2x B. 2 C. 2x + c D. $2x^2 + c$

14. The conjugate of $3 + i$ is

- A. -3 B. $3 - 5i$ C. $-3 + i$ D. $3 - i$

15. The number of 2 letter permutation that can be formed from the letters in the word BURCO.

- A. 20 B. 7 C. 8 D. 10

16. The value of $\int_1^2 5x^3 dx$ equals

- A. $\frac{4}{65}$ B. $-\frac{73}{4}$ C. $\frac{75}{4}$ D. $\frac{4}{75}$

17. In how many ways can Amarn, Fardowsa and Zeynab arrange themselves in queue?

- A. 4 B. 6 C. 5 D. 8

18. The value of $\sin x + 2 = 3$ will be:

- A. 180° B. 270° C. 90° D. 45°

19. In the recent presidential election of Somalia, five candidates got the following votes in the first round of election: Hassan sheikh Mohamud 52, Farmajo 59, Khaire 47, Deni 65

The mean of their votes is

- A. 70 B. 50 C. 55.75 D. 45

20. The coordinate of stationary point of the given function $y = x^2 - 4x$ is

- A. (2, -2) B. (2, 4) C. (-4, 2) D. (2, -4)

21. Hafsa has five grades from assessments and quizzes. They are all weighted equally. If her grades are 50, 70, 88, 70, and 88, what is her current average grade?

- A. 73.2 B. 61.3 C. 91.5 D. 88.4

22. If an event is impossible, then its probability will be

- A. 1 B. 0 C. 0.1 D. 0.5

23. The integration of $\int \sin x dx$ is

- A. $\cos x + c$ B. $-\cos x + c$ C. $\tan x + c$ D. $\csc x + c$

24. Mohamed has the following scores of the subject 60, 70, 80, 50, 80, his mode of score is

- A. 70 B. 80 C. 60 D. 59

25. The exact value of $\cos 40^\circ \cos 50^\circ - \sin 40^\circ \sin 50^\circ$ is

- A. -1 B. 0 C. -1 D. ∞

Part two: Match Column A with Column B (10 marks)

Column A	Column B
1. The integral of $\int \frac{3}{x} dx$ is	() 10
2. A box contains 3 math papers, 2 physics, and 4 chemistry papers. The probability of getting math paper is	() i
3. The modulus of $8 + 6i$ is	() $3\ln x + c$
4. The value of $[\cos \frac{\pi}{4} + i \sin \frac{\pi}{4}]^2$ is	() 2×3
5. The exact value of $\lim_{x \rightarrow 0} \frac{\sin x}{x}$ equals	() 120
6. The order of this matrix $A = \begin{bmatrix} 3 & 2 & 1 \\ 0 & 4 & 5 \end{bmatrix}$ is	() $\frac{1}{3}$
7. If a given function of $y = 6x^2 - 8x + 1$ then $\frac{dy}{dx}$ is	() 1
8. The number of ways can 5 textbooks arranged on a shelf is	() $\sin A \cos A$
9. $\frac{1}{2} \sin(2A)$	() $x + c$
10. The value of $\int dx$ is	() $\frac{dy}{dx} = 12x - 8$

Part three: Structure Questions (40 Marks)

Question one: Analytic trigonometry

- Use identities to identify the exact value of $\cos(-105^\circ)$ _____ (3 marks)
- Express $\sin 3x$ in terms of $\sin x$ _____ (3 marks)
- Simplify the expression $\frac{1 - \cos 5x}{\sin 5x}$ _____ (3 marks)
- Find the values of $\tan 2\theta$ if $\cos \theta = \frac{3}{5}$ and $\sin \theta < 0$. _____ (3 marks)

Question two: Statistics

- The following are marks of mathematic students, describe the range. _____ (4 marks)
29, 54, 54, 64, 74.
- Determine the mean, variance and standard deviation of the temperature reading below
 15°C , 16°C , 17°C , 18°C , 19°C , 20°C , 22°C , 24°C _____ (4 marks)

Questions three: Complex Numbers

1. Simplify each of the following _____ (4 marks)

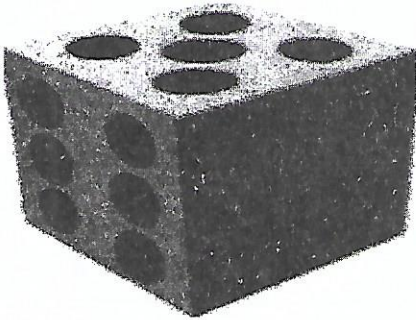
a) i^3 b) i^7

2. Add the following complex numbers $z_1 = 7 + 5i$ and $z_2 = -1 + 0i$ _____ (3marks)

3. Write $\frac{1+3i}{4-i}$ in terms of $a + bi$ _____ (3 marks)

Question four: Probability

1. If you were to roll the die one time what is the probability of it landing on a 2? ____ (5 marks)



2. In a class, there are 12 boys and 16 girls. One of them is called out using student registration number, what is the probability that the one called is a girl? ____ (5 marks)