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Total Score

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Name.....

School

Roll No

Republic of Somaliland

Somaliland National Examination Board

Form Four

**MATHEMATICS
PAPER ONE**

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 Mobile Not Allowed.

**PART ONE: 20 Multiple choice questions****(40 marks).****Circle the correct answer only.**1. Simplifying $(3 + 5i) - (5 - 3i)$ is equal to :

A. $(-2 + 8i)$

B. $(2 - 8i)$

C. $(8 + 2i)$

D. $(2, + 8i)$

2. In which quadrant does 120° lies?

A. I

B. II

B. III

C. IV

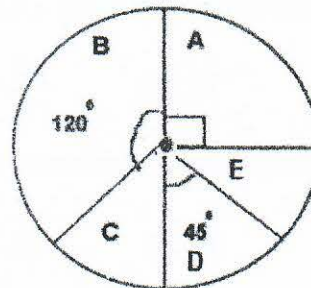
3. The marks obtained by a class of 240 students in a mathematics test were shown below. The number of students who obtained grade A is the same as:

A. 20

B. 40

C. 60

D. 80

4. The $\frac{d}{dx}(\cos x)$ is :A. $\cos x$ B. $\sin x$ C. $\tan x$ D. $-\sin x$ 5. Which one of the following is equivalent to $\sin 2A$?

A. $2 \cos^2 A - 1$

B. $2 \sin A \cos A$

C. $4 \sin 2A \cos 2A$

D. $\sin^2 A + \cos^2 A$

6. $\int (3x^2 + 2x) dx =$

A. $x^3 + 2x^2 + c$

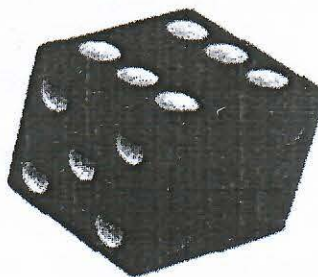
B. $3x^2 + 2x^2 + c$

C. $x^3 + x^2 + c$

D. $x^3 - x^2 + c$

7. An ordinary dice is thrown once. The probability of getting a prime number is:

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



8. The mode of the following numbers, 2, 13, 9, 8, 9, 13, 9 and 5 is:

- A. 13 B. 2 C. 8 D. 9

9. The gradient of the curve $y = x^3 - 2x^2 + 5x$ at $x = 1$ is:

- A. 5 B. 4 C. 2 D. 12

10. Using the binomial expansion of $(x - 2)^3$ then the coefficient of the x term is:

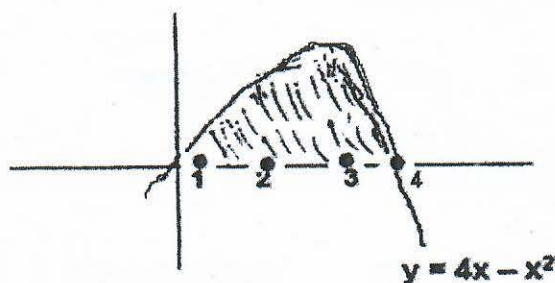
- A. -6 B. 12 C. -12 D. +6

11. In how many ways can 2 blue and 3 red balls be arranged in a row?

- A. 10 B. 20 C. -12 D. +6

12. The area under the curve shown below is equivalent to:

- A. 32 sq units
B. 160 sq units
C. $\frac{32}{3}$ sq units
D. $\frac{160}{3}$ sq units



13. Ahmed bought \$ 3200 for £ 2000. How many dollars can he buy for £ 8000?

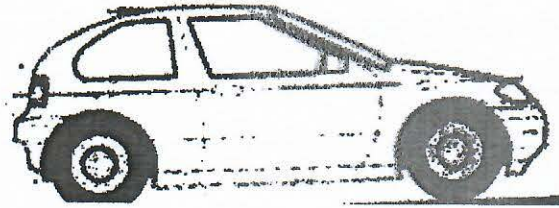
- A. \$ 3200 B. \$ 8000 C. \$ 4000 D. \$ 12800

14. If $f(x) = 2x + 3$, then $f(-3)$ is:

- A. -3 B. -6 C. -9 D. -12

15. The cost of a car is \$ 3600 includes a sales tax (VAT) of 20%. The cost of the Car without sales tax (VAT) is :

- A. \$ 3200
B. \$ 2800
C. \$ 2400
D. \$ 3000



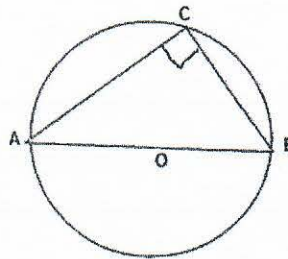
16. The range of the following salaries will be :

\$ 200, \$ 150, \$ 300, \$ 120, \$ 180, \$ 420, \$500

- A. \$ 120 B. \$ 180 C. \$ 380 D. \$ 300

17. Angle ACB is:

- A. 90°
B. 60°
C. 180°
D. 360°



18. The distance between the points A (8, 2) and (5, -2) is:

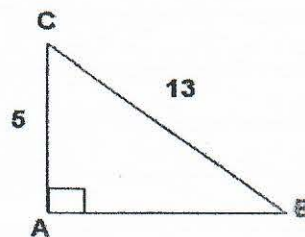
- A. 30 B. 25 C. 15 D. 5

19. Evaluate 20% of \$ 600

- A. \$ 80 B. \$ 120 C. \$ 620 D. \$ 480

20. The length of AB is equal to:

- A. 6
B. 9
C. 18
D. 12



PART TWO : STRUCTURED QUESTIONS. ANSWER ALL QUESTIONS.**(60 Marks)**

Q1. Simplify the following

a) $(2 + 3i) + (3 + 2i)$

(2 marks)

b) $(5 + 3i)(5 - 3i)$

(2 marks)

c) $i^5 + i^7$

(2 marks)Q2. Given that $\cos\theta = \frac{5}{13}$, where θ is an acute angle.

Find the exact value of

a) $\cos 2\theta$

(3 marks)

b) $\sin 2\theta$

(3 marks)

Q3. For the following data set: 2, 3, 5, 7, 5, 10, 11, 5

Calculate

a) The mean

(2 marks)

b) The median

(2 marks)

c) The mode

(2 marks)

Q4. Given that the curve $y = 2x^3 + 6x^2 - 5$

Find

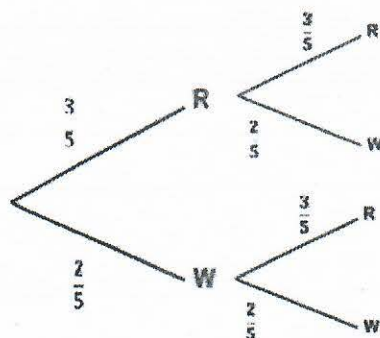
a) $\frac{dy}{dx}$

(2 marks)

b) The coordinates of the stationary points of the curve.

(4 marks)

Q5. A box contains 3 red and 2 white balls. Two balls are drawn at random from the box with replacement using the tree diagram below.



Find the probability of getting

a) two red balls

(2 marks)

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b) two of the same colours

(2 marks)

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c) two of different colours

(2 marks)

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Q6. Verify each of the following identities

a) $\sin(\pi - \theta) = + \sin \theta$

(3 marks)

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b) $\cos 40^\circ \cos 50^\circ - \sin 40^\circ \sin 50^\circ = 0$

(3 marks)

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Q7. Given that $f(x) = 2x + 5$

Find

a) $f(2)$

(2 marks)

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b) $f^{-1}(x)$

(2 marks)

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c) $f^{-1}(1)$

(2 marks)

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Q8. If an equation of a circle is $(x - 2)^2 + (y + 3)^2 = 25$

Find

a) the radius

(3 marks)

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b) the centre of the circle

(3 marks)

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Q9. Given that $A = \begin{bmatrix} 2 & -3 \\ 4 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 1 \\ 7 & 3 \end{bmatrix}$

Calculate

a) $A + B$

(2 marks)

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b) the determinant of B

(2 marks)

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c) the inverse of B

(2 marks)

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Q 10.

a) A real estate gets 6% commission for selling a house, if they sold a house for \$ 45000. What is its commission?

(3 marks)

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b) The selling price of a car is \$ 5000; the salesman gives 20% discount for cash. What is the discount price?

(3 marks)

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