

REPUBLIQUE DU CAMEROUN
Paix-Travail-Patrie

MINISTRE DES ENSEIGNEMENTS SECONDAIRES

CELLULE D'APPUI A L'ACTION PEDAGOGIQUE
ANTENNE REGIONALE DU NORD OUEST

BP 2183 MANKON BAMENDA
TEL 233 362 209
Email : trubamenda@yahoo.co.uk



REPUBLIC OF CAMEROON
Peace-Work-Fatherland

MINISTRY OF SECONDARY EDUCATION

TEACHERS' RESOURCE UNIT
REGIONAL BRANCH FOR THE NORTH WEST

P.O. BOX: 2183 MANKON BAMENDA
TEL 233 362 209
Email : trubamenda@yahoo.co.uk

MARCH 2023

FKARD EYANGUIS ODESTIE EUS/NE.

The Teachers' Resource Unit and the Regional Inspectorate of Pedagogy, in collaboration with MTA	SUBJECT CODE NUMBER 0575	PAPER NUMBER 1
GENERAL CERTIFICATE OF EDUCATION REGIONAL MOCK EXAMINATION	SUBJECT TITLE Additional Mathematics	
CANDIDATE NAME:		
CANDIDATE NUMBER:		
CENTRE NUMBER:		
ORDINARY LEVEL		

Time Allowed: One and a half hours
INSTRUCTIONS TO CANDIDATES:

Mobile phones are **NOT ALLOWED** in the examination room.

1. USE A SOFT HB PENCIL THROUGHOUT THIS EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the Examination begins:

3. Check that this question booklet is headed "Ordinary level -0575 code and subject title Additional Mathematics -Paper 1".
4. Insert the information required in the spaces above.
5. Without opening the booklet, pull out the answer sheet carefully from inside the front cover of this booklet. Take care that you do not crease or fold the answer sheet or make any marks on it other than those asked for in these instructions.
6. Insert the information required in the spaces provided on the answer sheet using your HB pencil:

Candidate Name, Centre Number, Candidate Number, Subject Code Number, and Paper number

How to answer questions in this examination:

7. Answer ALL the 50 questions in this examination. All questions carry equal marks.
8. Non-programmable calculators are allowed.
9. For each question there are four suggested answers, A, B, C and D. Decide which answer is correct. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen. For example, if C is your correct answer, mark C as shown below:

[A] [B] [C] [D]
10. Mark only one answer for each question. If you mark more than one answer, you will score zero for that question. If you change your mind about an answer, erase the first mark carefully, and then mark your new answer.
11. Avoid spending much time on any question. If you find a question difficult, move to the next. You can come back to the question later.
12. Do all rough work in this booklet using, where necessary, the blank spaces in the question booklet.
13. You must not take this booklet and answer sheet out of the examination room. All question booklets and answer sheets will be collected at the end of the examination.

1. Simplifying $\sqrt{50} + \sqrt{50}$ gives
 - A. $25\sqrt{2}$
 - B. $5\sqrt{2}$
 - C. $10\sqrt{2}$
 - D. $2\sqrt{25}$

2. The conjugate of $3 - 7\sqrt{6}$ is
 - A. $3 + 7\sqrt{6}$
 - B. $7\sqrt{6} - 3$
 - C. $-7\sqrt{6} + 3$
 - D. $-3 + 7\sqrt{6}$

3. The value of x for which $4^{2x-2} = 1$ is
 - A. 2
 - B. 0
 - C. -2
 - D. 1

4. The value of $\log_8(16)$ is
 - A. $\frac{4}{3}$
 - B. 2
 - C. $\frac{1}{2}$
 - D. $\frac{3}{4}$

5. Suppose $a > 0$ then $\log a(2a - 2) =$
 - A. $\log a - \log(2a + 2)$
 - B. $\log 2a + \log(a - 1)$
 - C. $\log a^2 + \log(a - 1)$
 - D. $\log 2a - \log(a + 1)$

6. The degree of the polynomial:
 $f(x) = 5x^4 - x^3 + 4x$ is
 - A. 3
 - B. 4
 - C. 5
 - D. 0

7. The quadratic equation $x^2 - x - 3 = 0$ has
 - A. Real and distinct roots
 - B. Real and equal roots
 - C. No real roots
 - D. Imaginary roots

8. The sum of the roots of the quadratic equation
 $-x^2 - 5x + 6 = 0$ is;
 - A. -5
 - B. 6
 - C. -1
 - D. 5

9. The remainder when the polynomial
 $f(x) = 4x^2 - 16$ is divided by $(x + 2)$ is
 - A. -2
 - B. 4
 - C. 0
 - D. 2

10. Given that 4, $2a$, and 9 are three consecutive terms of a geometric progression. The value of a is
 - A. -3
 - B. -6
 - C. -2
 - D. -4

11. The value of x for which $3x + 2$, $4x$ and $6x + 1$ are three consecutive of an arithmetic progression is
 - A. -3
 - B. $-\frac{5}{2}$
 - C. 4
 - D. $-\frac{2}{3}$

12. The sum to infinity of a convergent geometric series with first term a and common ratio r is given by
 - A. $S_\infty = \frac{1}{a-r}, |x| < 1$
 - B. $S_\infty = \frac{r}{1-a}, |x| < 1$
 - C. $S_\infty = \frac{1}{1-r}, |x| < 1$
 - D. $S_\infty = \frac{a}{a-r}, |x| < 1$

13. The value of the sum $\sum_1^6 5$ is
 - A. 30
 - B. 5
 - C. 11
 - D. 12

14. The number of ways of arranging the letters of the word GRATITUDE is
 - A. $\frac{8!}{2!}$
 - B. $\frac{9!}{2!}$
 - C. $8!$
 - D. $9!$

15. ${}^n C_0 =$
 - A. n
 - B. 0
 - C. 2
 - D. 1

16. The number of ways 5 students can be selected from 7 students is;
 - A. ${}^7 P_5$
 - B. ${}^{12} C_5$
 - C. ${}^{12} P_5$
 - D. ${}^7 C_5$

17. The expansion $(x - \frac{1}{x})^7$ has
 - A. 5 terms
 - B. 6 terms
 - C. 7 terms
 - D. 8 terms

18. The term independent of x in the binomial expansion of $(1 + 2x)^{-2}$ is
 - A. -1
 - B. -2
 - C. 1
 - D. 2

19. The range of values of x for which the expansion

$(1 + \frac{x}{3})^{-1}$ is valid is

- A. $-\frac{1}{3} \leq x \leq \frac{1}{3}$
- B. $-3 < x < 3$
- C. $-2 \leq x \leq 2$
- D. $-1 < x < 1$

20. $\frac{2\pi}{3}$ radians expressed in degrees is

- A. 90°
- B. 60°
- C. 120°
- D. 150°

21. Generally, $\sin(90^\circ - \theta)$ is the same as

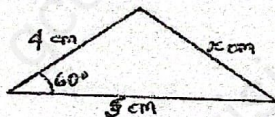
- A. $\cos(90^\circ + \theta)$
- B. $\sin(\theta - 90^\circ)$
- C. $\cos \theta$
- D. $\sin \theta$

22. The angle $\frac{7\pi}{6}$ radians is in the

- A. 1st quadrant
- B. 2nd quadrant
- C. 3rd quadrant
- D. 4th quadrant

23. In the diagram below, the value of x is

- A. $\sqrt{31}$
- B. $\sqrt{21}$
- C. 6
- D. 9



24. The tangent of an acute angle between the lines $L_1: y = 3x + 4$ and $L_2: y = x - 7$ is

- A. $\frac{1}{3}$
- B. $\frac{1}{2}$
- C. $\frac{1}{4}$
- D. $\frac{2}{3}$

25. The perpendicular distance from the point (1,0) to the line $x + y + 2 = 0$ is

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

26. The centroid of a triangle with vertices (3,2), (-3,4) and (3,0) is

- A. (3,1)
- B. (1,2)
- C. (3,2)
- D. (0,6)

27. The range of values of x for which $x^2 - 2x - 3 < 0$ is

- A. $-1 < x < 3$
- B. $x \geq -1 \cup x \leq 3$
- C. $-3 \leq x \leq 1$
- D. $-1 \leq x \leq 3$

28. $|x| \leq 2$ is the same as;

- A. $-2 < x < 2$
- B. $-2 \leq x \leq 2$
- C. $x \leq -2$
- D. $x \geq -2$

29. Given that $f(x) = 2x$; then $f(3x) - 3f(x) =$

- A. x
- B. $3x$
- C. 0
- D. $6x$

30. Given that $f(x) = \begin{cases} 2x-1, & 0 \leq x \leq 4 \\ x^2+5, & 4 < x \leq 10 \end{cases}$, then

- $f(4) =$
- A. 7
 - B. 9
 - C. 13
 - D. 21

31. The domain of definition of the function $f(x) = \frac{x^2}{x+6}$ is

- A. $\mathbb{R} - \{6\}$
- B. $\mathbb{R} - \{0\}$
- C. \mathbb{R}
- D. $\mathbb{R} - \{-6\}$

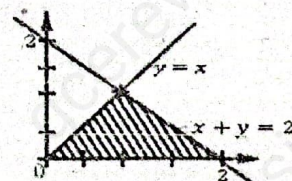
32. The linear transformation M is such that $M: (x, y) \mapsto (-2y, x + y)$. Its matrix of linear transformation is

- A. $\begin{pmatrix} 0 & -2 \\ 1 & 1 \end{pmatrix}$
- B. $\begin{pmatrix} -2 & 0 \\ 1 & 1 \end{pmatrix}$
- C. $\begin{pmatrix} 1 & 0 \\ 2 & -1 \end{pmatrix}$
- D. $\begin{pmatrix} 2 & 1 \\ -1 & 0 \end{pmatrix}$

33. In an optimization problem, which of the following is always true.

- A. $x \leq 0, y \leq 0$
- B. $x \geq 0, y \leq 0$
- C. $x \leq 0, y \geq 0$
- D. $x \geq 0, y \geq 0$

34. Which of the following set of inequalities satisfy the shaded region in the figure below



- A. $y \geq 0, y \leq x, x + y \leq 2$
- B. $y < 0, y \geq x, x + y < 2$
- C. $y > 0, y \leq x, x + y \geq 2$
- D. $y \leq 0, y > x, x + y \geq 2$

35. A man can share at most 10000frs to his two children ZENA (x) and AZAH (y). The inequality that represents this information is;
 A. $x + y \geq 10000$
 B. $x + y \leq 10000$
 C. $x + y > 10000$
 D. $x + y < 10000$
36. Given that (3,5) and (4,4) are vertices of two corner points of a feasible region. The maximum value of the objective function $f(x) = 5x + 3y$ is
 A. 33
 B. 30
 C. 34
 D. 32
37. The dot product of two perpendicular vectors is;
 A. 90°
 B. -1
 C. 0
 D. 180°
38. The unit vector in the direction of the vector $-4\mathbf{i} + 3\mathbf{j}$ is
 A. $\mathbf{i} + \mathbf{j}$
 B. $\frac{-4\mathbf{i} + 3\mathbf{j}}{7}$
 C. $\frac{-4\mathbf{i} + 3\mathbf{j}}{5}$
 D. $\frac{-4\mathbf{i} + 3\mathbf{j}}{1}$
39. The direction vector of the line $\mathbf{r} = 3\mathbf{i} + 5\mathbf{j} + t(-3\mathbf{i} + \mathbf{j})$, $t \in \mathbb{R}$ is
 A. $-3\mathbf{i} + \mathbf{j}$
 B. $3\mathbf{i} + 5\mathbf{j}$
 C. $-3\mathbf{i} + 5\mathbf{j}$
 D. $3\mathbf{i} + \mathbf{j}$
40. Given that \mathbf{a} and \mathbf{b} are two parallel vectors. Then
 A. $\mathbf{a} \cdot \mathbf{b} = 90$
 B. $\mathbf{a} = k\mathbf{b}$, where k is a scalar,
 C. $\mathbf{a} \cdot \mathbf{b} = 0$
 D. $\mathbf{a} \cdot \mathbf{b} = k$, where $k \neq 0$ is a scalar
41. The binary operation $*$ defined on the set \mathbb{Z} by $a * b = (a - b)^2 + 2$, where $a, b \in \mathbb{Z}$. The value of $9 * 10$ is
 A. -1
 B. 1
 C. 3
 D. 4
42. Given that $(G, *)$ forms a group and that e is the identity in G . Which of the following is true $\forall x \in G$?
 A. $x * e = e$
 B. $e * e = x$
 C. $x * x = e$
 D. $x * e = x$
43. Which of the following properties is particular about an Abelian group?
 A. closure
 B. commutativity
 C. associativity
 D. symmetry
44. The gradient function at an arbitrary point (x, y) of the curve $y = x^2 - 2x + 4$ is
 A. $2x - 2$
 B. $x^2 - 2x$
 C. $x^2 - 2$
 D. $2x + 4$
45. The gradient of the tangent to the curve $y = x^3$ at $x = -2$ is
 A. -8
 B. 8
 C. 12
 D. -12
46. The coordinates of the turning point of the curve $y = -3x^2 + 12x - 9$ is;
 A. (2,3)
 B. $(-2,3)$
 C. (3,2)
 D. $(-3,-2)$
47. Given that $y = 2x \sin x$, then $\frac{dy}{dx} =$
 A. $2x \sin x - x^2 \cos x$
 B. $2 \sin x + 2x \cos x$
 C. $x \sin x + x \cos x$
 D. $x \sin x - 2x \cos x$
48. $\int (6x^2 + 1) dx =$
 A. $2x^2 + 3x + k$, $k \in \mathbb{R}$
 B. $12x + k$, $k \in \mathbb{R}$
 C. $2x^3 + x + k$, $k \in \mathbb{R}$
 D. $6x^3 + 3 + k$, $k \in \mathbb{R}$
49. $\int_0^{\pi/2} \cos x dx =$
 A. -2
 B. $\frac{\pi}{2}$
 C. 0
 D. 1
50. The area of the finite region bounded by the lines $y = x$, $x = 5$ and the x -axis is
 A. 24sq units
 B. $\frac{25}{2}$ sq units
 C. 12sq units
 D. 20sq units

END

GO BACK AND CHECK YOUR WORK