CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

General Certificate of Education Examination

0575 ADDITIONAL MATHEMATICS 1

JUNE 2020 **ORDINARY LEVEL**

Centre Number	
Centre Name	
Candidate Identification No.	
Candidate Name	

Mobile phones are NOT allowed in the examination room.

MULTIPLE CHOICE QUESTION PAPER

One and a half hours

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE 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 Additional Mathematics 1**"
4. Fill in the information required in the spaces above.
5. Fill in the information required in the spaces provided on the answer sheet using your HB pencil:
   Candidate Name, Exam Session, Subject Code and Candidate Identification Number.
   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.

How to answer the questions in this examination:

6. Answer **ALL** the **50** questions in this Examination. All questions carry equal marks.
7. **Calculators are allowed.**
8. Each question has FOUR suggested answers: **A, B, C** and **D**. Decide which answer is appropriate. 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]
9. Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.
10. Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.
11. Do all rough work in this booklet using the blank spaces in the question booklet.
12. **At the end of the examination, the invigilator shall collect the answer sheet first and then the question booklet. DO NOT ATTEMPT TO LEAVE THE EXAMINATION HALL WITH IT.**

1. $a^m \times a^n =$
   A a^{m-n}
   B a^{m+n}
   C $(a^m)n$
   D $a^m + a^n$

2. $\log_2 8 =$
   A 64
   B 256
   C 4
   D 3

3. $\sqrt{72} =$
   A: $2\sqrt{6}$
   B: $6\sqrt{2}$
   C: $3\sqrt{12}$
   D: $12\sqrt{3}$

4. The product of the roots of the quadratic equation $2x^2 - 5x + 4 = 0$ is:
   A $\frac{5}{4}$
   B $-\frac{5}{4}$
   C 4
   D 2

5. The quadratic equation $x^2 + 5x + 3 = 0$ has roots $\propto$ and β. The value of $\frac{\propto+\beta}{\alpha\beta}$ is:
   A $\frac{5}{3}$
   B: $-\frac{5}{3}$
   C $\frac{3}{5}$
   D $-\frac{3}{5}$

6. Given that $ax^2 + bx + c = 0, a \neq 0$, has equal roots, where a, b and c are real constants, then the correct statement below is :
   A $b^2 + 4ac = 0$
   B $b^2 - 4ac > 0$
   C $b^2 - 4ac \geq 0$
   D $b^2 - 4ac = 0$

7. Given that $(x + 1)$ is a factor of $x^3 - \kappa x^2 + 3x + 2$, the value of the constant κis:
   A: 6
   B: -6
   C: 0
   D: -2

8. The remainder when $x^3 - x^2 + 3x - 2$ is divided by $(x - 1)$ is:
   A -1
   B -2
   C 2
   D 1

9. The nth term of a series is given by:
   $T_n = (-1)^n[1 - n]$, the fourth term is:
   A -4
   B -3
   C 3
   D 4

10. The geometric mean of 2 and 8 is:
   A 16
   B 4
   C 5
   D 10

11. The 5th term of the sequence 9,3,1, ... is:
   A $\frac{1}{81}$
   B $\frac{1}{27}$
   C $\frac{1}{9}$
   D $\frac{1}{3}$

12. The sum to infinity of a geometric progression with first term a and common ratio r, where $|r| < 1$ is:
   A $\frac{a}{1+r}$
   B ar^{n-1}
   C $\frac{a(1-r^n)}{1-r}$
   D $\frac{a}{1-r}$

13. The first three terms of the binomial expansion $(1-2x)^6$ are:

A $1+12x+60x^2+\cdots$
B $1-12x+60x^2+\cdots$
C $1+12x-60x^2+\cdots$
D $1-12x-60x^2+\cdots$

14. The coefficient of x^2 in the binomial expansion of $(1-x)^5$ is:

A 10
B -10
C 20
D -20

15. The number of ways in which the letters of the word "**BEES**" can be arranged is:

A 3!
B 4!
C $\frac{3!}{2!}$
D $\frac{4!}{2!}$

16. ${}^7C_3 =$

A 210
B 21
C 35
D 840

17. The trigonometric ratio which is positive in the fourth quadrant is:

A $sinx$
B $cosx$
C $cosecx$
D $cotx$

18. $Sin2\theta \equiv$

A $cos^2\theta - sin^2\theta$
B $2cos^2\theta - 1$
C $2sin\theta cos\theta$
D $1-2sin^2\theta$

19. The value of θ , $0° \leq \theta \leq 180°$, for which $\cos\theta = \frac{\sqrt{3}}{2}$ is:

A $30°$
B $60°$
C $120°$
D $150°$

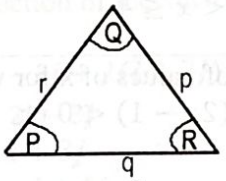
20. The length of the minor arc of a circle of radius 6cm which subtends an angle of $\frac{\pi}{3}$ at the centre is:

A 2π
B π
C 3π
D 4π

21. $\text{Cos}(90° + \theta) \equiv$

A $\sin\theta$
B $-\sin\theta$
C $\cos\theta$
D $-\cos\theta$

22.



From the diagram, $p^2 =$

A $q^2+r^2+2qrcosP$
B $q^2+r^2-2qrcosQ$
C $q^2+r^2-2qrcosP$
D $q^2+r^2+qrcosQ$

23. The coordinates of the midpoint joining the points $A(3, \quad -5)$ and $B(-5, 3)$ is:

A $(-1, \quad -1)$
B $(-2, \quad -2)$
C $(4, \quad -4)$
D $(-2, \quad 2)$

24. The tangent of the acute angle between the lines $y = 2x$ and the positive $x-axis$ is:

A 1
B 2
C $\frac{1}{2}$
D 0

25. The equation of the straight line with gradient -2 passing through the point (1 ,2) is:

A $2x+y+4=0$
B $2x-y-4=0$
C $2x-y+4=0$
D $2x+y-4=0$

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26. The value of m for which the lines $y = 3x + 5$ and $y = mx - 2$ are perpendicular is:

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

27. The range of values of x for which $-3 < 2x - 5 \leq 3$ is:

A $-4 < x \leq -1$
B $-4 < x \leq 1$
C $-1 < x \leq 4$
D $1 < x \leq 4$

28. The set of values of x for which $(x + 3)(2x - 1) < 0$ is:

A $\left\{x: x < -3 \text{ and } x > \frac{1}{2}\right\}$
B $\left\{x: x < -\frac{1}{2} \text{ and } x > 3\right\}$
C $\left\{x: -3 < x < \frac{1}{2}\right\}$
D $\left\{x: -\frac{1}{2} < x < 3\right\}$

29. The values of x for which $|2x - 3| = 5$ are:

A $-1 \text{ and } 4$
B $1 \text{ and } 4$
C $-4 \text{ and } -1$
D $-4 \text{ and } -1$

30. Enanga went to a store and bought x pens at 50frs each and y rulers at 100frs each. Given that the maximum amount of money she spent was 1000Frs, the inequality satisfying her expenditure is:

A $x + 2y \geq 20$
B $x + 2y > 20$
C $x + 2y < 20$
D $x + 2y \leq 20$

31. The inequalities that satisfy the statements "x is at least half of y" and "y is at most one third of x" is:

A $2x \geq y \text{ and } 3y \leq x$
B $2x \leq y \text{ and } 3y \leq x$
C $2x \geq y \text{ and } 3y \geq x$
D $2x \leq y \text{ and } 3y \geq x$

32. The functions f and g are defined as $f: x \to x + \frac{1}{2}$ and $g: x \to 2x - 3$, then the function, gf defined in a similar manneris:

A $2x - 1$
B $2x - 2$
C $2x - \frac{5}{2}$
D $2x + \frac{5}{2}$

33. The function, f is defined by

$$f(x) = \begin{cases} x^2, & x > 0 \\ -x, & x \leq 0. \end{cases}$$

The value of $f(-3)$ is:

A 3
B -3
C 9
D -9

34. The inverse of the function $f: x \to \frac{1-2x}{3}, x \in \Re$ is:

A $\frac{3x-1}{2}, x \in \Re$
B $\frac{1-3x}{2}, x \in \Re$
C $\frac{1+3x}{2}, x \in \Re$
D $\frac{3x+2}{2}, x \in \Re$

35. The transformation T defined as $T: (x, y) \to (4x, \ 2x - y)$ is represented by the matrix:

A $\begin{pmatrix} 4 & 4 \\ 2 & -1 \end{pmatrix}$
B $\begin{pmatrix} 4 & 2 \\ 4 & -1 \end{pmatrix}$
C $\begin{pmatrix} 4 & 2 \\ 0 & -1 \end{pmatrix}$
D $\begin{pmatrix} 4 & 0 \\ 2 & -1 \end{pmatrix}$

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36. The image of the point $(-3,\ 2)$ under the transformation, T, defined by the matrix $\begin{pmatrix} 1 & 1 \\ 2 & -1 \end{pmatrix}$ is:

A $(1, 8)$
B $(-1,\ 8)$
C $(1, -8)$
D $(-1, -8)$

37. The invariant line under the transformation, T, defined by the matrix $\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$ is:

A $x + y = 0$
B $x - y = 0$
C $x = 0$
D $y = 0$

38. The binary operation $*$ is defined over the set of real numbers, $\Re$, as $x * y = \frac{x^2 - 2xy}{2}$. The value of $2 * -3$ is:

A -4
B 4
C 8
D -8

39.

*	1	3	5	7
1	1	3	5	7
3	3	1	7	5
5	5	7	1	3
7	7	5	3	1

The inverse of 3 under this operation is:

A 1
B 3
C 5
D 7

40.

*	2	4	6	8
2	4	8	2	6
4	8	6	4	2
6	2	4	6	8
8	6	2	8	4

From the operation table, the set $\{2, 4, 6, 8\}$ forms a group under $*$. Which of the following is NOT a sub group under this operation?

A $\{(2,\ 6),\ *\}$
B $\{(4,\ 6),\ *\}$
C $\{(2,\ 4),\ *\}$
D $\{6, 8), *\}$

41. The direction of the vector equation of the line $\boldsymbol{r} = 2\boldsymbol{i} - 3\boldsymbol{j} + \lambda(\boldsymbol{i} + 3\boldsymbol{j})$ is:

A $2\boldsymbol{i} - 3\boldsymbol{j}$
B $\boldsymbol{i} + 3\boldsymbol{j}$
C $-\boldsymbol{i} + 6\boldsymbol{j}$
D $\boldsymbol{i} - 6\boldsymbol{j}$

42. The unit vector in the direction of $-4\boldsymbol{i} + 3\boldsymbol{j}$ is:

A $\frac{4}{5}\boldsymbol{i} + \frac{3}{5}\boldsymbol{j}$
B $-\frac{4}{5}\boldsymbol{i} + \frac{3}{5}\boldsymbol{j}$
C $\frac{4}{5}\boldsymbol{i} - \frac{3}{2}\boldsymbol{j}$
D $-\frac{4}{5}\boldsymbol{i} - \frac{3}{5}\boldsymbol{j}$

43. $\boldsymbol{a}.\boldsymbol{b} =$

A $|\boldsymbol{a}||\boldsymbol{b}|cos\theta$
B $\boldsymbol{ab}cos\theta$
C $|\boldsymbol{a}||\boldsymbol{b}|sin\theta$
D $\boldsymbol{ab}sin\theta$

44. The vector equation of the line joining the two points with position vectors **a** and **b** is:

A $\boldsymbol{r} = \boldsymbol{a} + \lambda(\boldsymbol{b} - \boldsymbol{a})$
B $\boldsymbol{r} = \boldsymbol{a} + \lambda\boldsymbol{b}$
C $\boldsymbol{r} = \boldsymbol{b} + \lambda\boldsymbol{a}$
D $\boldsymbol{r} = (\boldsymbol{a} - \boldsymbol{b}) + \lambda\boldsymbol{b}$

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45. $\frac{d}{dx}(3x^2) =$

A $\frac{2}{3}x^3$
B $6x$
C $\frac{3}{2}x^3$
D $6x^2$

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46. $\frac{d}{dx}(sin2x) =$

A $-2cos2x$
B $2cos2x$
C $cos2x$
D $-cos2x$

---

47. The gradient of the curve, $y = cosx$ at the point where $x = 0$ is:

A: 0
B: 1
C: -1
D: $\frac{\pi}{2}$

---

48. $\int 2x^3\,dx =$

A: $6x^4 + k$
B: $\frac{1}{2}x^4 + k$
C: $\frac{2}{3}x^3 + k$
D: $\frac{2}{3}x^4 + k$

[*Where, k is an arbitrary constant of integration*]

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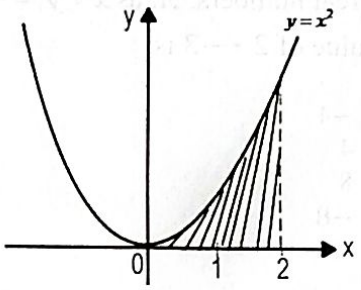
49. $\int sin3xdx =$

A: $\frac{1}{3}cos3x + k$
B: $3cos3x + k$
C: $-\frac{1}{3}cos3x + k$
D: $-3cos3x + k$

[*Where, k is an arbitrary constant of integration*]

50.



The area of the shaded region bounded by the curve$y = x^2$, in the range $0 \leq x \leq 2$ is:

A $\frac{8}{3}$
B 2
C $\frac{4}{3}$
D 8

STOP

GO BACK AND CHECK YOUR WORK