CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

General Certificate of Education Examination

0575 ADDITIONAL MATHEMATICS 1

JUNE 2019 **ORDINARY LEVEL**

Centre Number	
Centre Name	
Candidate Identification No.	
Candidate Name	

Mobile phones are NOT allowed in the examination room.

⇒ It implies
∨ OR
∧ And
⁻¹ Inverse.

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. $a^{\frac{1}{2}} =$
   - A $\sqrt{a}$
   - B $\frac{1}{a}$
   - C $\sqrt{2a}$
   - D $\frac{1}{a^2}$

2. $\log_3 3^3 =$
   - A 27
   - B 9
   - C 3
   - D 6

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

4. The sum of the roots of the quadratic equation $ax^2 + bx + c = 0, a \neq 0$ is:
   - A $\frac{c}{a}$
   - B $\frac{b}{a}$
   - C $-\frac{c}{a}$
   - D $-\frac{b}{a}$

5. $\alpha^2 + \beta^2 =$
   - A $(\alpha + \beta)^2$
   - B: $(\alpha + \beta)^2 + 2\alpha\beta$
   - C $(\alpha + \beta)^2 - 2\alpha\beta$
   - D $(\alpha + \beta)^2 - \alpha\beta$

6. The quadratic equation $ax^2 + bx + c = 0, a \neq 0$, is said to have real and distinct roots if and only if:
   - A $b^2 - 4ac \geq 0$
   - B $b^2 - 4ac > 0$
   - C $b^2 - 4ac = 0$
   - D $b^2 - 4ac < 0$

7. Given that $(x - 1)$ is a factor of $x^3 - 2x^2 + kx + 6$, then the value of k is:
   - A: -5
   - B: -7
   - C: 5
   - D: 7

8. The remainder when $x^3 - x^2 + 4x + 4$ divides $(x + 1)$ is:
   - A -1
   - B -2
   - C 2
   - D 1

9. Given that $U_n = (-1)^n 2^{n-1}$ is the nth term of a sequence, then U_3 is:
   - A 4
   - B $\frac{1}{4}$
   - C $-\frac{1}{4}$
   - D -4

10. The geometric mean of 4 and 9 is:
    - A $\frac{13}{2}$
    - B 13
    - C 6
    - D 36

11. Given that the sum of the first two terms of an AP is 10 with common difference 2, then the value of the first term is:
    - A 4
    - B 5
    - C 6
    - D 8

12. The sum to infinity of the sequence 9, 3, 1... is:
    - A $\frac{9}{4}$
    - B 13
    - C $\frac{27}{2}$
    - D $\frac{27}{4}$

13. The first three terms of the binomial expansion $(1+x)^{-1}$ are:
A $1+x+x^2+\ldots$
B $1+x-x^2+\ldots$
C $1-x+x^2+\ldots$
D $1-x-x^2+\ldots$

14. The number of terms in the binomial expansion $(1+4x)^{12}$ is:
A: 11
B: 12
C: 13
D: 14

15. The number of ways in which the letters of the word "FOOL" can be arranged is:
A: $\frac{4!}{2!}$
B: $\frac{3!}{2!}$
C: 3!
D: 4!

16. ${}^nC_r =$
A: $\frac{(n-r)!}{r!}$
B: $\frac{n!}{(n-r)!}$
C: $\frac{n!}{(n-r)!\,r!}$
D: $\frac{n!}{r(n-1)!}$

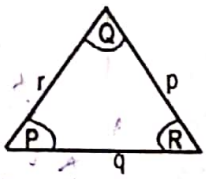
17. The trigonometric ratio which is positive in the second quadrant is:
A: $sinx$
B: $cosx$
C: $cotx$
D: $secx$

18. $Cos2\theta \equiv$
A: $2cos\theta sin\theta$
B: $cos^2\theta - sin^2\theta$
C: $1+2cos^2\theta$
D: $1+2\,sin^2\theta$

19. The value of θ, $0^\circ \le \theta \le 180^\circ$, for which $tan\theta = \sqrt{3}$ is:
A 30°
B 60°
C 120°
D 150°

20. $\frac{3}{4}\pi$ in degrees is:
A 45°
B 75°
C 105°
D 135°

21. $Sin(P+Q) \equiv$
A: $sinPcosQ + sinQcosP$
B: $sinPcosQ - sinQcosP$
C: $cosPcosQ + sinPsinQ$
D: $cosPcosQ - sinPsinQ$

22.


From the diagram, $SinP =$
A $\frac{p}{rsinR}$
B $\frac{r}{psinR}$
C $\frac{rsinR}{p}$
D $\frac{psinR}{r}$

23. The length of the line joining the points $A(3,0)$ and $B(0,-4)$ is:
A: 7
B: 25
C: 1
D: 5

24. The tangent of the angle between the line $y = 3x$ and the positive $x-$ axis is:
A: 1
B: 3
C: $\frac{1}{3}$
D: 0

25. The equation of the straight line with gradient -2 passing through the point $(0,3)$ is:
A: $2x+y=3$
B: $2x-y=3$
C: $3x+y=2$
D: $3x-y=2$

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

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

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 range of values of x for which $(x + 3)(2x - 1) > 0$ is:

A $x < -3$ or $x > \frac{1}{2}$
B $x < -\frac{1}{2}$ or $x > 3$
C $-3 < x < \frac{1}{2}$
D $-\frac{1}{2} < x < 3$

29. The range of values of x for which $|x - 3| < 5$ is:

A $-8 < x < -2$
B $-8 < x < 2$
C $-2 < x < 8$
D $2 < x < 8$

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

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

31. The inequalities that represent the statements "y must not be more than one third of x"and "y must not be less than half of x" are:

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

32. Given that the functions f and g are such that $f: x \mapsto 2x - 7$ and $g: x \mapsto x + 1$, where $x \in \mathfrak{R}$, then fg is:

A $2x + 5$
B $2x + 9$
C $2x - 5$
D $2x - 9$

33. The function, f, is defined by:

$$f(x) = \begin{cases} x, & x \geq 0 \\ 2 - x, & x < 0 \end{cases}$$

The value of $f(-2)$ is:

A 4
B -4
C 2
D -2

34. Given the function, $g: x = \frac{2 + 3x}{2}$, then $g^{-1}(-1)$ is:

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

35. The transformation, T, is defined by $T: (x, y) \rightarrow (3x, -x + y)$. The matrix that represents the transformation T is:

A $\begin{pmatrix} 3 & -1 \\ 0 & 1 \end{pmatrix}$
B $\begin{pmatrix} 3 & -1 \\ 0 & 1 \end{pmatrix}$
C $\begin{pmatrix} 3 & 0 \\ -1 & 1 \end{pmatrix}$
D $\begin{pmatrix} 0 & 3 \\ -1 & 1 \end{pmatrix}$

36. Given that $M = \begin{pmatrix} 2 & 1 \\ 4 & 3 \end{pmatrix}$, then the determinant of $2M$ is:

A 2
B 4
C 6
D 8

37. The invariant point under the Transformation, T, defined by the matrix $\begin{pmatrix} 3 & 0 \\ 1 & 2 \end{pmatrix}$ is:

A $(0,2)$
B $(0,0)$
C $(2,0)$
D $(1,-1)$

38.

*	1	2	3	4
1	1	1	1	1
2	2	4	3	1
3	3	4	2	1
4	4	1	4	1

From the operation table $(2 * 4) * 1 =$

A 1
B 2
C 3
D 4

39. Given that the binary operation $*$ is defined over the set of real numbers as $a * b = a + b - 4$. The identity element under this operation is:

A 0
B 1
C 2
D 4

40.

*	P	Q	R	S
P	Q	S	P	R
Q	S	R	Q	P
R	P	Q	R	S
S	R	P	S	Q

Given that from the operation table the set $\{P, Q, R, S\}$ forms a group under $*$. The order of the group is:

A 1
B 8
C 16
D 4

41. Given that the vector equation of a line is $\boldsymbol{r} = \boldsymbol{i} + 2\boldsymbol{j} + t(2\boldsymbol{i} - \boldsymbol{j})$ then the direction vector of the line is:

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

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

A $\frac{1}{5}(3\boldsymbol{i} - 4\boldsymbol{j})$
B $\frac{1}{25}(3\boldsymbol{i} - 4\boldsymbol{j})$
C $-\frac{1}{5}(3\boldsymbol{i} - 4\boldsymbol{j})$
D $-\frac{1}{25}(3\boldsymbol{i} - 4\boldsymbol{j})$

43. Given that $\boldsymbol{a} = 2\boldsymbol{i} - 3\boldsymbol{j}$ and $\boldsymbol{b} = \boldsymbol{i} + 2\boldsymbol{j}$, then $\boldsymbol{a} \cdot \boldsymbol{b} =$

A -5
B 5
C -4
D 4

44. The vector equation of the line passing through the point P with position vector $\boldsymbol{i} + \boldsymbol{j}$ and direction $\boldsymbol{i} - 2\boldsymbol{j}$ is given by:

A $\boldsymbol{r} = \boldsymbol{i} - 2\boldsymbol{j} + \lambda(\boldsymbol{i} + \boldsymbol{j})$
B $\boldsymbol{r} = \boldsymbol{i} + \boldsymbol{j} + \lambda(-3\boldsymbol{j})$
C $\boldsymbol{r} = \boldsymbol{i} + \boldsymbol{j} + \lambda(\boldsymbol{i} - 2\boldsymbol{j})$
D $\boldsymbol{r} = \boldsymbol{i} - 2\boldsymbol{j} + \lambda(3\boldsymbol{j})$

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

A $\frac{1}{2}x^4$
B $2x^4$
C $6x^2$
D $6x^2$

46. $\frac{d}{dx}(sin3x)$

A $3cos3x$
B $-3cos3x$
C $cos3x$
D $-cos3x$

47. The gradient of the curve $y = x^2$ at the point $x = 3$is:

A: 9
B: 6
C: 2
D: 3

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

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

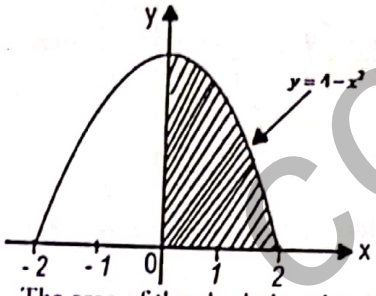
[Where, k is an arbitrary constant of integration]

49. $\int sin2x\, dx =$

A: $\frac{1}{2}cos2x + k$
B: $2cos2x + k$
C: $-\frac{1}{2}cos2x + k$
D: $-2cos2x + k$

[Where, k is an arbitrary constant of integration]

50.



The area of the shaded region bounded by the curve $y = 1 - x^2$, in the range $0 \leq x \leq 2$ is:

A $\frac{16}{3}$
B 2
C $\frac{8}{3}$
D $\frac{2}{3}$

STOP
GO BACK AND CHECK YOUR WORK

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