GOVERNMENT BILINGUAL HIGH SCHOOL YAOUNDE

MOCK GCE

APRIL 2021 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 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.
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.
9. Mark only one answer for each question. If 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.**

TURN OVER

1. $(\sqrt[n]{a})^m =$

A: $a^{n/m}$
B: $a^{m/n}$
C: $\frac{a^m}{a^n}$
D: $\frac{a^n}{a^m}$

---

2. $\log(xy) =$

A: $xlogy$
B: $logx - logy$
C: $logx + logy$
D: $log(x + y)$

---

3. The conjugate of $\sqrt{5} - 3$ is:

A: $\sqrt{5} + 3$
B: $\sqrt{5} - 3$
C: $-\sqrt{5} - 3$
D: $-\sqrt{5} + 3$

---

4. Given that α and β are the roots of a quadratic equation, then $\alpha^2 + \beta^2$ is:

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

---

5. The minimum value of the function $f(x) = (x + 3)^2 - 7$ is:

A: -3
B: -7
C: 3
D: 7

---

6. The quadratic equation whose sum of roots is 3 and product of roots -2 is:

A: $x^2 - 3x + 2 = 0$
B: $x^2 + 3x - 2 = 0$
C: $x^2 - 3x - 2 = 0$
D: $x^2 + 3x + 2 = 0$

---

7. The remainder when $x^3 - x^2 + 7x + 8$ is divided by $(x + 1)$ is:

A: -1
B: -2
C: 2
D: 1

---

8. The value of k for which $(x + 2)$ is a factor of $x^3 - kx^2 + 3x + 2$ is:

A: -3
B: 0
C: 3
D: 4

---

9. The nth term of a sequence is given by $U_n=(-1)^n 2^{n-1}$, then 5^{th} term is:

A: $-\frac{1}{16}$
B: -16
C: $\frac{1}{16}$
D: 16

---

10. The sum of the first n terms of an arithmetic progression is $S_n = n(2n - 7)$, then the second term of the progression is:

A: -11
B: -6
C: -5
D: -1

---

11. The sum to infinity of the sequence 9,3,1 ⋯ is:

A: $\frac{27}{4}$
B: $\frac{9}{4}$
C: $\frac{27}{2}$
D: 13

---

12. The value of x for which the geometric mean of $2x$ and 9 is 6 is:

A: 2
B: $\frac{3}{2}$
C: $\frac{1}{3}$
D: 36

---

13. ${}^{n}C_{r} =$

A: $\frac{n!}{(n-r)!r!}$

B: $\frac{n!}{(n-r)!}$

C: $\frac{n!}{r!}$

D: $\frac{(n-r)!}{r!}$

---

14. The number of terms in the binomial expansion of $\left(2x - \frac{1}{x}\right)^{10}$ is:

A: 9

B: 10

C: 11

D: 12

---

15. The number of permutations of the letters of the word **"GILLETTE"** is:

A: $\frac{8!}{2!2!}$

B: $\frac{5!}{2!2!2!}$

C: $\frac{5!}{2!2!}$

D: $\frac{8!}{2!2!2!}$

---

16. The coefficient of x^2 in the binomial expansion of $(1-2x)^{-1}$ is:

A: -4

B: -2

C: 2

D: 4

---

17. $\cos 2x \equiv$

A: $cos^2x + sin^2x$

B: $2cos^2x + 1$

C: $-2sin^2x + 1$

D: $2cosxsinx$

---

18. In which quadrant is $sinx$ positive and $cosx$ negative?

A: First Quadrant

B: Second Quadrant

C: Third Quadrant

D: Fourth Quadrant

---

19. Given that $\tan\theta = \sqrt{3}$, then the value of θ, for $0^0 \leq \theta \leq 90^0$ is:

A: 30^0

B: 45^0

C: 60^0

D: 90^0

---

20. The period of $y = sin2x$ is:

A: π

B: 2π

C: $\frac{\pi}{4}$

D: $\frac{\pi}{2}$

---

21. $\frac{3\pi}{4}$ in degrees is:

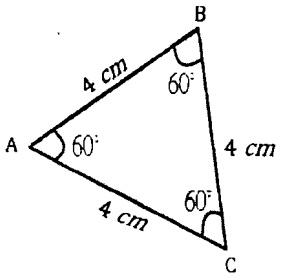
A: 270°

B: 330°

C: 240°

D: 135°

22.



Given that triangle ABC is an equilateral triangle with side 4cm, the area of the triangle ABC is:

A: $8\sqrt{3}$

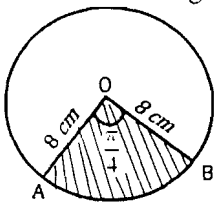
B: $4\sqrt{3}$

C: $2\sqrt{3}$

D: 8

---

23. From the diagram the area, in square units, of the shaded region is:



A: 16π

B: 8π

C: 4π

D: 2π

---

24. The distance between the points $A(2,-1)$ and $B(0,-2,)$ is:
A: $\sqrt{3}$
B: $\sqrt{6}$
C: $\sqrt{10}$
D: $\sqrt{5}$

25. The perpendicular distance from the point $(1, 2)$ to the line $4x - 3y + 10 = 0$ is:
A: 8
B: $\frac{8}{\sqrt{5}}$
C: $\frac{8}{5}$
D: $\frac{12}{\sqrt{5}}$

26. The tangent of the acute angle between the line $y + 3x = 2$ and the $x - axis$ is:
A: -3
B: -2
C: 2
D: 3

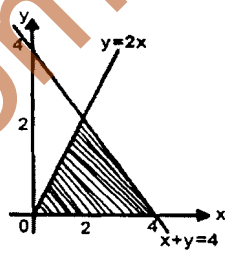
27. The equation of the line passing through the point (0, 6) with gradient -2 is:
A: $y = 2x + 6$
B: $y = -2x + 6$
C: $y = -2x - 6$
D: $y = 2x - 6$

28. The values of x for which $|x - 2| = 5$ are
A: -7 *and* -3
B: -7 *and* 3
C: 7 *and* -3
D: 7 *and* 3

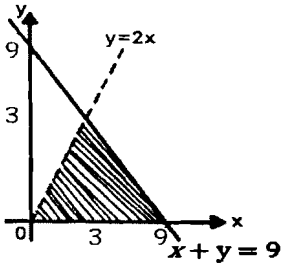
29. The range of values of x for which $4 - 2x > 7$ is:
A: $x < \frac{3}{2}$
B: $x > \frac{3}{2}$
C: $x < -\frac{3}{2}$
D: $x > -\frac{3}{2}$

30. The range of values of x for which $(2 - x)(x + 1) \leq 0$ is:
A: $-1 \leq x \leq 2$
B: $-2 \leq x \leq -1$
C: $x \leq -1$ *or* $x \leq 2$
D: $x \leq -2$ *or* $x \leq -1$

31. Rose want to a shop and bought x pens at 50 francs each and y rulers at 100 francs each. Given that she spent only 1000francs, the inequality satisfying her expenditure is:
A: $x + 2y \geq 20$
B: $x + 2y < 20$
C: $x + 2y > 20$
D: $x + 2y \leq 20$

32.


Using the shaded region above, the maximum value of the constraint $3x + 2y$ is:
A: 6
B: 10
C: 12
D: 16

33.


Which of the following inequalities represent the shaded region in the figure above?
A: $y \geq 0,\ y \leq 2x,\ x + y \leq 9$
B: $y \geq 0,\ y < 2x,\ x + y < 9$
C: $y \geq 0,\ y \leq 2x,\ x + y < 9$
D: $y \geq 0,\ y < 2x,\ x + y \leq 9$

34. Given that the functions f and g are defined over the set of real numbers, $\mathbb{R}$ by $f: x \mapsto 2x + 3$ and $g: x \mapsto x - 5$, then the composite function $gf: x \mapsto$

A: $2x + 2$
B: $2x + 7$
C: $2x - 2$
D: $2x - 7$

---

35. The inverse of the function $y = \log_a x$ is:

A: a^x
B: a^y
C: $\log_y a$
D: $\log_x a$

---

36. The transformation, T is defined as $T: (x,\ y) \mapsto (x + 2y,\ 3x + y)$. The invariant point under T is:

A: $(2, 2)$
B: $(1, 1)$
C: $(2, 3)$
D: $(0, 0)$

---

37. Given the matric equation, $M\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} X \\ Y \end{pmatrix}$, then $\begin{pmatrix} x \\ y \end{pmatrix} =$

A: $M\begin{pmatrix} X \\ Y \end{pmatrix}$
B: $M^T\begin{pmatrix} X \\ Y \end{pmatrix}$
C: $M^{-1}\begin{pmatrix} X \\ Y \end{pmatrix}$
D: $M^*\begin{pmatrix} X \\ Y \end{pmatrix}$

---

38. The transformation, T, is defined by $T: (x, y) \mapsto (2x + 3y, -2x - y)$. Which of the following matrices represent the transformation, T?

A: $\begin{pmatrix} 2 & -2 \\ 3 & -1 \end{pmatrix}$
B: $\begin{pmatrix} 2 & 3 \\ -2 & -1 \end{pmatrix}$
C: $\begin{pmatrix} 2 & 3 \\ 2 & -1 \end{pmatrix}$
D: $\begin{pmatrix} 2 & 3 \\ -2 & 1 \end{pmatrix}$

---

39. The binary operation * is defined over the set of integers, $\mathbb{Z}$ by $x * y = x^2 - y + 6$, then the value of $-2 * 1$ is:

A: -9
B: -1
C: 1
D: 9

---

40. Given the operation table below.

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

The inverse of S is:

A: P
B: Q
C: R
D: S

---

41. An operation * is defined on the set, S, where $S = \{0, 1, 3, 5\}$. Given that $(S,*)$ forms a group, then the order of the group is:

A: 4
B: 5
C: 9
D: 16

---

42. Given that the set $T = \{0,1,2,3\}$ as shown on the operation table forms a group under the operation $*$.

*	0	1	2	3
0	3	2	0	1
1	2	3	1	0
2	0	1	2	3
3	1	0	3	2

One subgroup of $(T,\ *)$ is:

A: $(\{2, 1\},\ *)$
B: $(\{2, 3\},\ *)$
C: $(\{0, 2\},\ *)$
D: $(\{0, 3\},\ *)$

---

43. The vector equation of a line is given by $\boldsymbol{r} = 2\boldsymbol{i} + 3\boldsymbol{j} + t(3\boldsymbol{i} - \boldsymbol{j})$. The direction vector of $\boldsymbol{r}$ is:

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

---

44. Given that two vectors $2\boldsymbol{i} - 6\boldsymbol{j}$ and $-2\boldsymbol{i} + t\boldsymbol{j}$ are parallel, then the value of t is:

A: -6
B: -3
C: 3
D: 6

---

45. Given that $\boldsymbol{p} = 6\boldsymbol{i} + 2\boldsymbol{j}$ and $\boldsymbol{q} = 2\boldsymbol{i} - \boldsymbol{j}$, then $|\boldsymbol{p} - \boldsymbol{q}| =$

A: $\sqrt{5}$
B: $\sqrt{17}$
C: 5
D: 17

---

46. Given that $= uv$, where u and v are real functions in x, then $\frac{dy}{dx} =$

A: $v\frac{du}{dx} + u\frac{dv}{dx}$
B: $v\frac{dv}{dx} + u\frac{du}{dx}$
C: $v\frac{du}{dx} - u\frac{dv}{dx}$
D: $v\frac{dv}{dx} + u\frac{du}{dx}$

---

47. $\frac{d}{dx}(sinx) =$

A: $cosx$
B: $sinx$
C: $-cosx$
D: $-sinx$

---

48. The value of x for which the function $f(x) = 5 - 2x - 2x^2$ has a maximum turning point is:

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

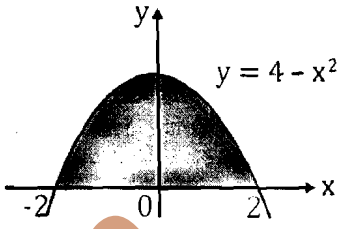
---

49. $\int cos3\theta d\theta =$

A: $-\frac{1}{3}sin3\theta + k$
B: $\frac{1}{3}sin3\theta + k$
C: $-3sin3\theta$
D: $3sin3\theta$

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

50.



The area of the shaded region in the diagram above bounded by the curve $y = 4 - x^2$ and the positive x-axis is:

A: $\frac{32}{3}$
B: $\frac{16}{3}$
C: 4
D: 0

STOP GO BACK AND CHECK YOUR WORK