SOUTH WEST REGIONAL MOCK EXAMINATION
GENERAL EDUCATION

The Teachers' Resource Unit (TRU) in collaboration with the Regional Pedagogic Inspectorate for Science Education and the South-West Association of Mathematics Teachers (SWAMT)	**Subject Code 0575**	**Paper Number 1**
CANDIDATE NAME ..... CANDIDATE NUMBER ..... CENTRE NUMBER	**Subject Title** **ADDITIONAL MATHEMATICS**	
ORDINARY LEVEL	**DATE 25/03/2022**	

Time Allowed: One hour thirty minutes

INSTRUCTIONS TO CANDIDATES:

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 Additional Mathematics, Paper 1".
4. Insert the information required in the spaces provided 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 question. You can come back to this question later.
12. Do all rough work in this booklet using, where necessary, the blank spaces in the question booklet.
13. Mobile phones are **NOT ALLOWED** in the examination room.
14. **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. $(\frac{1}{9})^{-\frac{1}{2}} =$

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

---

2. $\frac{\log_a p}{\log_a q} =$

A $\log_q p$
B $\log_a(pq)$
C $\log_a(p-q)$
D $\log_a(\frac{p}{q})$

---

3. The conjugate of $2\sqrt{5}-4$ is

A $2\sqrt{5}+4$
B $4-2\sqrt{5}$
C $-4-2\sqrt{5}$
D $-2\sqrt{5}+4$

---

4. The two roots of the equation $x^2-2x-1=0$ are :

A real and equal.
B imaginary.
C distinct.
D real and distinct.

---

5. A quadratic equation has roots α and β. Given that the sum of the roots is $\frac{1}{2}$ and their product $\frac{4}{5}$, the value of $\alpha^2\beta+\alpha\beta^2$ is

A $\frac{2}{5}$
B $\frac{2}{10}$
C $\frac{4}{10}$
D $\frac{5}{8}$

---

6. The sum of the roots of $ax^2+bx+5=0$ is 3 and their product is $\frac{5}{3}$. Then the value of b is

A 3
B -9
C -3
D 9

---

7. Which of the following expressions is a polynomial function?

A $7x+15$
B $\sqrt{3x^2+2x+10}$
C $\frac{1}{2x^2+4x+8}$
D $\log(4x^3-7x^2+9x-5)$

---

8. $(x+1)$ divides the expression $5x^3+kx^2-2$ without a remainder. Then the value of k is

A -3
B 3
C -7
D 7

---

9. The sequence 15, 5, 1, . . . , with common ratio, r, is convergent because

A it is a decreasing G.P.
B it is an increasing G.P.
C it is a G.P. with $|r|<1$.
D it is a G.P. with $|r|>1$.

---

10. The general term of a sequence of numbers is given by $U_n=(-1)^{2n+1}(5-8n)$. Then the second term of the sequence is

A -11
B 11
C -33
D 33

---

11. The arithmetic mean of -2 and -8 is

A 5
B -5
C 4
D -4

---

12. The sum of the first n terms of a sequence is given as $S_n=2n(n-1)$. Then the third term of the sequence is

A 12
B -8
C -12
D 8

---

13. Expand the expression, leaving your answer without factorials. $\frac{n!}{(n-2)!} =$

A n^2-n
B $n-1$
C $-\frac{1}{2}$
D $\frac{n}{(n-1)}$

---

14. In how many ways can 2 girls be selected from a group of 2 boys and 3 girls?

A 6
B 10
C 1
D 3

15. The first three terms in the expansion of $(2-4x)^{-1}$, in ascending powers of x, are

A $\frac{1}{2}+x-2x^2$

B $\frac{1}{2}+x+2x^2$

C $\frac{1}{2}-x+2x^2$

D $\frac{1}{2}-x-2x^2$

---

16. The expansion of $(a+5x)^8$ is written in increasing powers of x. Given that the integer r takes values 0,1,2,3, . . . , the general term of the expansion is

A $\binom{8}{r}a^r(5x)^{(8-r)}$

B $(ar)^8+(5rx)^8$

C $\binom{8}{r}a^{(8-r)}(5x)^r$

D $\binom{r}{8}a^{(8-r)}(5x)^r$

---

17. The period of the function $y=tanx$ is

A 360°

B 270°

C 180°

D 90°

---

18. $\frac{7\pi}{6}$ radians is equivalent to

A 180°

B 210°

C 215°

D 310°

---

19. $sin\theta=\frac{\sqrt{3}}{2}$ and $tan\theta<0$. Then $\theta=$

A 60°

B 240°

C 300°

D 120°

---

20. $\cos(90°+\alpha)$ is the same as

A $-sin\alpha$

B $sin\alpha$

C $-cos\alpha$

D $cos\alpha$

---

21. A sector, AOB, subtends an angle of $\frac{\pi}{6}$ radians at the centre, O, of the circle with radius 6 cm. The length of the major arc, in cm, is

A 11π

B π

C 5π

D 2π

22.

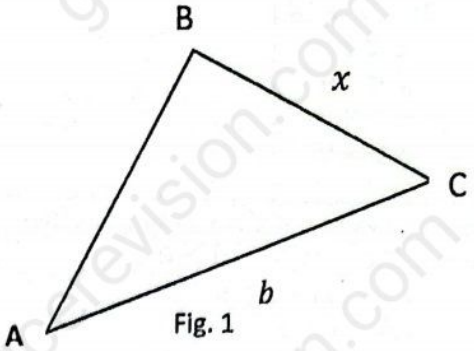

Fig. 1

From triangle ABC in fig.1 above, $x=$

A $\frac{bsinB}{sinA}$

B $\frac{bcosA}{cosB}$

C $\frac{bsinA}{sinB}$

D $\frac{bcosB}{cosA}$

---

23. The coordinates of the point of intersection of the lines $l_1: x=5$ and $l_2: x+3y=-4$ are

A $(5,3)$

B $(-3,5)$

C $(3,5)$

D $(5,-3)$

---

24. Given that the lines $l_1: y=ax+m$ and $l_2: bx+y=n$ are perpendicular, where a, b, m and n are real constants, then

A $mn=-1$

B $ab=1$

C $mn=1$

D $ab=-1$

---

25. The equation of the straight line which passes through the point (2, 3) and is parallel to the line $y=5x+9$ is

A $y-3=5(x+2)$

B $y-3=5(x-2)$

C $y-3=\frac{1}{5}(x+2)$

D $y-3=-\frac{1}{5}(x-2)$

---

26. The value of the tangent of the acute angle between the lines y=4x-3 and y= 2x+1 is

A $\frac{2}{9}$

B 2

C $\frac{4}{3}$

D $\frac{2}{7}$

---

27. The range of values of x for which $-13-2x<x+14$ is

A $x<9$
B $x<-9$
C $x>9$
D $x>-9$

28. The range of values of x which satisfies the Inequality $(2x-3)(5-x)\geq 0$ is

A $x\leq 1.5 \text{ or } x\geq 5$
B $1.5<x<5$
C $1.5\leq x\leq 5$
D $-5\leq x\leq 1.5$

29. A man decides to spend at least 3000 FCFA and at most 5000 FCFA at a bakery. He buys x pastries at 500 FCFA each and y drinks at 600 FCFA each. The inequality which best satisfies his expenditure plan is

A $30\leq 5x+6y\leq 50$
B $30\leq 11xy\leq 50$
C $30<5x+6y\leq 50$
D $30<5x+6y<50$

30.

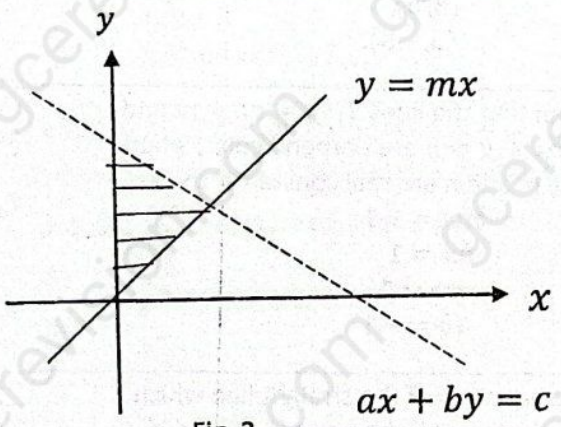

Fig. 2

The set of inequalities that satisfy the shaded region in fig. 2 is

A $x\geq 0,\ y\geq 0,\ y\geq mx,\ ax+by<c$
B $x\geq 0,\ y\geq 0,\ y>mx,\ ax+by<c$
C $x\geq 0,\ y\geq 0,\ y\geq mx,\ ax+by\leq c$
D $x>0,\ y>0,\ y>mx,\ ax+by\leq c$

31. Given that $|2-x|>5$, then

A $-3<x<7$
B $-7<x<3$
C $x<-7 \text{ or } x>3$
D $x<-3 \text{ or } x>7$

B $\frac{3x-5}{4}$

32. The function h is given by $h(x)=\begin{cases}7-x, x<7\\ 7+x, x\geq 7\end{cases}$, for all $x\in\mathbb{R}$. Then $h(-10)=$

A -3
B 3
C 17
D -17

33. The functions f and g are defined by $f:x\mapsto 3x-5$ and $g:x\mapsto 4-2x$, where x is a real number. Then $gf(x)=$

A $7-6x$
B $14-6x$
C $-6-6x$
D $7-2x$

34. Given the function $f:x\mapsto\frac{4x-5}{3}, x\in\mathbb{R}$, $f^{-1}(x)=$

A $\frac{3}{4x-5}$
C $\frac{3x+5}{4}$
D $\frac{3}{4x+5}$

35. The transformation M is a reflection in the line $y=x$. Then M has matrix

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

36. A transformation, T, is represented by the matrix $\begin{pmatrix}2&-5\\-3&4\end{pmatrix}$. Then T is defined as

A $T:(x,y)\longrightarrow(2x+4y,-5x-3y)$
B $T:(x,y)\longrightarrow(2x-5y,-3x+4y)$
C $T:(x,y)\longrightarrow(-5x-3y,2x+4y)$
D $T:(x,y)\longrightarrow(2x-3y,-5x+4y)$

37. The invariant line under the transformation N, where $N=\begin{pmatrix}4&1\\3&2\end{pmatrix}$, is

A $x-y=0$
B $3x-y=0$
C $x+y=0$
D $3x+y=0$

38.

*	p	q	r	s
p	s	p	q	r
q	p	q	r	s
r	q	r	s	p
s	r	s	p	q

In the operation table above, the set $\{p, q, r, s\}$ forms a group under the binary operation $*$. The result of $s * (p * r)$ *is*

A p
B q
C r
D s

---

39. The binary operation Δ is defined over the set of real numbers, $\mathbb{R}$, by $x \Delta y = (3x - 2y + 1) mod\ 7$.
The value of $5 \Delta 2$ is

A 5
B 6
C 1
D 15

40.

⊛	2	4	6	8
2	8	6	2	4
4	6	8	4	2
6	2	4	6	8
8	4	2	8	6

In the group $(\{2, 4, 6, 8\}, ⊛)$, represented in the operation table above, the inverse of the element 4 is

A 4
B 2
C 8
D 6

---

41. The vector equation of a straight line is Given by $l: \boldsymbol{r} = 3i + j + \lambda(i - 5j)$.
The direction of line l is

A $3i + j$
B $4i - 4j$
C $i - 5j$
D $2i + 6j$

---

42. The scalar product of the vectors $2i + 4j$ and $-i + kj$ is -14. Then the value of k is

A 3
B -3
C 4
D -4

---

43. The magnitude of the vector $ai + bj$ is given as

A $\sqrt{a^2 + b^2}$
B $\sqrt{a^2 - b^2}$
C $\sqrt{a + b}$
D $\sqrt{a - b}$

---

44. Given the points $P(2, -3)$ and $Q(-1,2)$, the vector equation of the line parallel to the line segment PQ is

A $\boldsymbol{r} = 2i - 3j + \lambda(3i - 5j)$
B $\boldsymbol{r} = -i + 2j + \lambda(3i - 5j)$
C $\boldsymbol{r} = 2i - 3j + \lambda(-3i + 5j)$
D $\boldsymbol{r} = i - j + \lambda(-3i + 5j)$

---

45. $\frac{d}{dx}(4x^3 - 5) =$

A $4x^2$
B $12x^2$
C $x4-5x$
D $4x^4 - 5x$

---

46. The gradient function of $cos4x$ is

A $-4sin4x$
B $\frac{1}{4}sin4x$
C $4sin4x$
D $-\frac{1}{4}sin4x$

---

47. The gradient of the curve $y = 3x^2 - x + 2$ at the point $(1,4)$ is

A -23
B -5
C 23
D 5

---

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

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

where k is an arbitrary constant of integration.

---

49. $\int(cos3x)dx =$

A $3sin3x + c$
B $\frac{1}{3}sin3x + c$
C $-3sin3x + c$
D $-\frac{1}{3}sin3x + c$,

where c is an arbitrary constant of integration.

50.

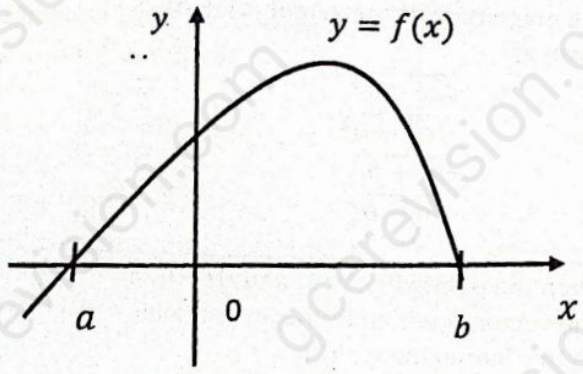

Fig. 3

In Fig. 3 above, the total area enclosed by the curve $y = f(x)$, the x-axis and the $y - axis$ is given by

A $\int_a^b f(x)dx$

B $\int_a^b f'(x)dx$

C $\int_0^b f(x)dx$

D $\int_0^b f'(x)dx$

GO BACK AND CHECK YOUR WORK