7160/1/2025
MATHEMATICS A/L

SOUTH WEST REGIONAL MOCK EXAMINATION
TECHNICAL AND VOCATIONAL EDUCATION

The Teachers' Resource Unit (TRU) in collaboration with the Regional Pedagogic Inspectorate -Sciences and the South West Association of Mathematics Teachers (SWAMT)	**Subject Code** 7160	**Paper Number** 1
CANDIDATE NAME ..... CANDIDATE NUMBER ..... CENTRE NUMBER	**Subject Title** MATHEMATICS	
TVE ADVANCED LEVEL	**DATE: MONDAY 24/03/2025--MORNING**	

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 "TVE Advanced Level – 7160 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. The exact value of $\sin 15^{\circ}$ is

A	$\frac{1}{4}(\sqrt{6}+\sqrt{2})$
B	$\frac{1}{\sqrt{3}}(2+\sqrt{2})$
C	$\frac{1}{2\sqrt{2}}(\sqrt{3}+1)$
D	$\frac{1}{4}(\sqrt{6}-\sqrt{2})$

2. Given that $y = 2+3sint$, and $x = 3+2cost$ then the Cartesian equation of the curve is

A	$9(x-3)^2+4(y-2)^2=36$
B	$4(x-3)^2+9(y-2)^2=36$
C	$3x-2y=13$
D	$3x-2y=5$

3. For what value of x, is $2^{3x}=0.25$?

A	$\frac{2}{3}$
B	$-\frac{2}{3}$
C	$-\frac{1}{3}$
D	$\frac{1}{12}$

4. The limit of $\frac{4x-x^3}{2-x}$ as x tends to 2 is

A	0
B	-8
C	8
D	4

5. Given that $p(x)=x^3-3x^2+9x+13$, the value of $p(-1)$ is

A	2
B	18
C	0
D	6

6. The total number of cartons of square tiles of dimension 30cm required to completely cover the floor of a room 3.5m by 4m is (consider that each carton contains 15 tiles)

A	9
B	10
C	11
D	12

7. The real valued function f is defined on R, the set of real numbers by $f: x \to ax+b$. Given that $f^{-1}(4)=5, f^{-1}(2)=3$ it implies that the value of $a+b$ is

A	8
B	5
C	2
D	0

8. Given the function $f(x)=\begin{cases}2x+1, 0\le x\le 2\\ 7-x, 2<x<4\\ x, \quad 4\le x\le 6\end{cases}$. The function f is continuous at a point with x equals

A	4
B	5
C	6
D	2

9. The area of the finite region bounded by the curve $y=x(2-x)$ and the x-axis is

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

10. The set of value of x for which $x^2-5x+4\le 0$

A	$1\le x\le 4$
B	$1\ge x\ge 4$
C	$x\in\,]1,4[$
D	$x\in]-\infty,1[\cup]4,+\infty[$

11. The $\lim_{x\to 4}\frac{\sqrt{x}-2}{x-4}$ is

A	0
B	$\frac{1}{4}$
C	1
D	$\frac{1}{2}$

12. A curve is defined such that $yx^2+x^3+2y=2$. The gradient of the curve at $P(2,-1)$ is

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

13. The equation $x = \frac{1}{4}(y-1)^2 + 5$ is a/an

A	Hyperbola
B	Circle
C	Ellipse
D	Parabola

14 Decomposing $\frac{x+1}{x-2}$ into partial fractions gives

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

15. If $\frac{8^2}{2^{(2+4^4)}} = 2^p$. *Therefore p is equal to*

A	-16
B	16
C	4
D	-4

16. Given that $16\log_x 5 = \log_5 x$ and that $x > 1$ then the value of x is

A	16
B	100
C	625
D	64

17. The sum of the first 21 terms of the series $-20, -18, -16 \ldots \ldots$ is

A	-840
B	1134
C	0
D	-15

18. The first term of a series in geometric progression is 24 and the fourth term is 81. The tenth term of the progression is

A	$\frac{3^{11}}{2^9}$
B	$\frac{2^7}{3^9}$
C	$\frac{3^9}{2^6}$
D	$\frac{3^{10}}{2^6}$

19. Three terms of a sequence are given by $2+\sqrt{3},\ 5+\sqrt{3},\ 8+\sqrt{3}, \ldots$. Implies its n^{th} term is

A	$(3n+1)+\sqrt{3}$
B	$(2n+1)+\sqrt{3}$
C	$(2n-1)+\sqrt{3}$
D	$(3n-1)+\sqrt{3}$

20. The number of ways of arranging all the letters of the word BOOKS are:

A	60
B	120
C	30
D	80

21. Given that the tangent to the curve $y = 2x^2 + ax + 15$ at the point $P(-2,11)$ is perpendicular to the line $2y = x + 7$, the value of a gives

A	$\frac{23}{2}$
B	6
C	8
D	$\frac{1}{2}$

22. The exact value of $\left(\frac{81}{256}\right)^{\frac{3}{4}}$ is

A	$\frac{9}{64}$
B	$\frac{3}{4}$
C	$\frac{36}{64}$
D	$\frac{27}{64}$

23. The cross sectional diameter of a round pillar with equation of cross-section $(x-2)^2 + (y+3)^2 - 9 = 0$ is

A	3 units
B	18 units
C	6 units
D	1.5 units

24. The horizontal asymptote to the curve of the function $f(x) = \frac{(x-1)^2}{(x+3)(x-2)}$ is

A	$y = 2$
B	$y = 0$
C	$y = 1$
D	$x = -3$

25. The number of ways that 3 students can be seated in a bus of 20 seats are:

A	6840
B	1140
C	60
D	1240

26. The value of $Re\left(\frac{1+i}{1-i}\right)$ is

A	-1
B	0
C	i
D	2

27. The domain of definition of the function $g(x) = log\left(\frac{1-x}{2+x}\right)$ is

A	$D_f =]-\infty, -2[u]1, +\infty[$
B	$D_f =]-2, 1[$
C	$D_f =]-\infty, -2[$
D	$D_f =]1, +\infty[$

28. If the graph of the function $f(x) = 4k^x$ passes through the point $(2, 36)$, then the value of k is

A	36
B	2
C	9
D	3

29. Given that $U_n = 5^{n-1}$, then $\lim_{n\to-\infty} U_n$ is

A	0
B	$\frac{1}{5}$
C	$-\infty$
D	$+\infty$

30. $H(x) = 3x^2 + 12x + 17$ expressed in the form $a(x+b)^2 - k$, implies the value of k is equal to

A	17
B	$\frac{-17}{3}$
C	5
D	-5

31. The $\lim_{x\to 0} \frac{sinx-x}{sinx}$ is

A	1
B	0
C	π
D	$\frac{1}{\sqrt{2}}$

32. If $x^2 - 1$ is a factor of $t(x) = 2x^3 - p + qx + 6$, then p and q have values

A	$p = 2,\ q = 6$
B	$p = 12, q = 20$
C	$p = 6, q = -2$
D	$p = 6, q = 2$

33. The hyperbola with equation $9x^2 - 16y^2 = 144$ has one of its foci at the point

A	(4, 0)
B	(3, 0)
C	(5, 0)
D	(1, 0)

34. If $a + \frac{1}{a} = 4$ then $a^2 + \frac{1}{a^2}$ is

A	14
B	16
C	5
D	12

35. Given that $x^3 + y^3 = 370$ and $x + y = 10$, the positive value of $x - y$ is

A	1
B	4
C	0
D	10

36. What must be added to the polynomial $6x^4 - 23x^3 + 11x^2 + 12x$ to make it exactly divisible by $x - 1$?

A	6
B	-6
C	18
D	-18

37. The modulus of the complex number $\frac{1+i}{1+\sqrt{3}i}$ gives

A	$\sqrt{3}$
B	$\sqrt{5}$
C	$\frac{1}{\sqrt{2}}$
D	$\sqrt{2}$

38. If $C^y = K$, the value of C when $y = -\frac{1}{2}$ and $K = 2$ is

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

39. The probability distribution of a random variable X is as shown on the table below.

x	1	2	3	4
$P(X = x)$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{k}{15}$

The value of k is

A	$\frac{27}{4}$
B	$\frac{12}{}$
C	1
D	$\frac{1}{2}$

40. The general solution of the equation $\text{cosec}\,\theta = \frac{2}{\sqrt{3}}$ *is*

A	$\theta = \pi n + (-1)^n \frac{\pi}{6}$
B	$\theta = \pi n + (-1)^n \frac{\pi}{3}$
C	$\theta = 2\pi n \pm \frac{\pi}{3}$
D	$\theta = \pi n + \frac{\pi}{3}$

41. If $x^2 + y^2 = 9$, then $\frac{dy}{dx}$ *is equals to*

A	$2x + 2y$
B	$\frac{9 - 2x}{y}$
C	$\frac{y}{x}$
D	$-\frac{x}{y}$

42. If $= ln3x - lnx$, then $\frac{dy}{dx}$ is equal to

A	$\frac{2}{x}$
B	$\frac{-2}{3x}$
C	ln3
D	0

43. The line $3y - 4x = 12$ cuts the y-axis at

A	$(3, 0)$
B	$(-3, 0)$
C	$(0, -4)$
D	$(0, 4)$

44. The solution set defined $\forall x \in \mathbb{R}$ of the equation: $e^{2x} - 16 = 0$ is

A	$S = \{ln8\}$
B	$S = \{ln4\}$
C	$S = \{ln32\}$
D	$S = \left\{\frac{ln8}{ln2}\right\}$

45. The value of x for which $\sqrt{x^2 + 1} = 7 - x$ gives

A	$\frac{24}{7}$
B	$-\frac{24}{7}$
C	$\frac{7}{24}$
D	$\frac{-7}{24}$

46. The domain of definition of the function $g(x) = \frac{2x+1}{x^2+4}$ is

A	$D_g = \mathbb{R}$
B	$D_g = [-\infty, +\infty]$
C	$D_g = [-\infty, +2[$
D	$D_g =]\infty, -2[u]2, +\infty[$

47. If $f(x) = 2x$ and $g(x) = 1 - 3x$ then $fg(2)$ is

A	10
B	−10
C	−11
D	11

48. The modulus of the vector $\overline{V} = -6i + 2j + 3k$ is

A	$3\sqrt{5}$
B	$\sqrt{41}$
C	7
D	−1

49. The exact value of $4sin\frac{\pi}{3}cos\left(\frac{-\pi}{3}\right)$ is

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

50. Given the function $f(x) = 2x^2 - 8x$. The gradient of the curve of $f(x)$ at the point $(-1, 8)$ is

A	1
B	−6
C	8
D	−12

END.

GO BACK AND CHECK YOUR WORK.