ASMOPSS THAILAND 2026

Asian Science & Mathematics Olympiad for Primary and Secondary Schools (Thailand)

Mathematics Secondary G.9

Sunday, August 9, 2026

8:30 – 10:00 a.m. (90 minutes)

$$\sum x^2$$

B

Instructions

1. This exam includes 25 questions, with a total score of 100.
2. Fill out your name, grade, school, test center, room, seat number, and identification number either in pen or in pencil.
3. Use a 2B black pencil or darker one to fill in the circles corresponding to your answer written at the top.
4. Use a pen or a pencil to write your answer in the box at the top of the column.
5. If you want to change an answer that you have already marked, use a clean eraser to erase the incorrect answer and mark the new one.
6. It should be noted that figures in the exam are not drawn to scale.
7. Dictionaries, calculators, and electronic devices are not permitted in the test room.
8. Note taking can be done on the test paper only, with no extra sheet provided.
9. If the answer is a number that is more than 3-digit number or decimal number, please answer as the following pattern:
   - 9.1 If the answer is more than 3-digit number, then answer the last 3 digits.
   - 9.2 If the answer is more than two decimal places, then round the answer to the nearest hundredth.
10. Do not write anything or make any symbols in the black barcode area along the edge of the paper except the answers on the answer sheet. Make sure the answersheet is not crumpled.
11. Submit the answer sheet to the proctor when the time is up.
12. Cheating in the exam may cause serious consequences including disqualification from receiving any award or joining the second round of the test held by ASMOPSS THAILAND.

Should any disagreement arise, the judgment of the panel is deemed final.

Announcement of the results via https://asmopssthailand.com on September 18, 2026

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1. If $3^{x+1} = 27$ and $1024^{\frac{1}{y}} = 4$, what is the value of x^y? (2.5 points)

2. Let $x + \frac{1}{x} = \sqrt{7}$, find $x^2 + \frac{1}{x^2}$. (2.5 points)

3. Given that the solution interval of $-\frac{3}{4} \leq -2x + \frac{5}{4} \leq \frac{3}{4}$ is $[a,b]$. Find $4(a+b)^2$. (2.5 points)

4. A two-digit number has a sum of digits equal to 12. If the digits are rearranged, the resulting number increases by 18. Find the original two-digit number. (2.5 points)

5. A rectangular field is 12 meters wide and 16 meters long. If you travel from one corner to the opposite corner along the diagonal, how many meters shorter will it be than walking along the edge of the field? (2.5 points)

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6. If similar triangles have a ratio of corresponding sides of $3:5$ and the area of the smaller triangle is 36 square units, what is the area of the larger triangle? (2.5 points)

7. Given that trapezoid $ABCD$ such that $AB = 10$ units, $CD = 20$ units, and $AB \parallel CD$. If diagonals AC and BD intersect at point O, the triangle ABO has an area of 25 square units. Find the area of trapezoid $ABCD$. (2.5 points)

8. Let $C(1,-2)$ be the center of rotation. If $P'(a,b)$ is the point resulting from rotating the point $(-3,6)$ counterclockwise around point C by an angle of 270°, then find the value of $a^2 - ab + b^3$. (2.5 points)

9. Given $x = \sqrt{2+\sqrt{2+\sqrt{2+\ldots}}}$, find the sum of all possible values of x. (4.5 points)

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10. A vendor sold an item for 1,200 baht, making a profit of $x\%$. If she wants to double her profit, she needs to sell the item for 1,550 baht. Find the cost of the item. (4.5 points)

11. Find the value of $\left(\sqrt{7+2\sqrt{10}}+\sqrt{7-2\sqrt{10}}\right)^2$. (4.5 points)

12. Let n be a natural number satisfying $\left(x-1\right)\left(x^{n-1}+x^{n-2}+x^{n-3}+\ldots+x+1\right)=x^n-1$. Suppose the remainder when the sum $2569+2569^3+2569^5+\ldots+2569^{2k-1}$ is divided by 2570 is 2500. Determine the smallest possible value of k. (4.5 points)

13. A right triangle ABC where angle B is a right angle, the lengths of sides AB and BC are 5 units and 12 units, respectively. What is the shortest distance from point B to side AC? (4.5 points)

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14. A cylindrical tank has a radius of 110 centimeters and a height of 56 centimeters. It is filled with water to half of its total volume. If a solid steel cube is placed into the tank, the water level rises by 27% of the original volume of water. Find the length of side of the cube in centimeters. (Given that $\pi = \frac{22}{7}$.) (4.5 points)

15. Mathematics test scores of 10 students, arranged in ascending order, are as follows:

$x,\ 32,\ 33,\ 35,\ y,\ z,\ 41,\ 42,\ 45,\ 47$

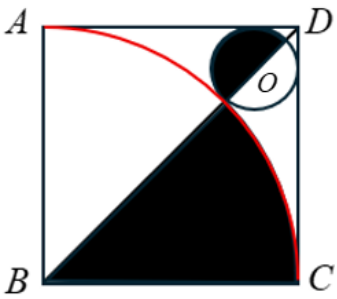
If the arithmetic mean of all 10 students is 36, and after removing the lowest score, the arithmetic mean and median of the remaining students increase by 3 and 2, respectively, find $LCM\left(x,y,z\right)$. (4.5 points)

16. Let $P(x) = x^n + ax + b$, where a,b are constants and $n = 2026$. If $P(x)$ is divisible by $(x-1)^2$, find the value of $\frac{|a-b|}{10}$. (6 points)

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17. Let a,b,c be distinct real numbers that satisfy the equation $a+\frac{2}{b}=b+\frac{2}{c}=c+\frac{2}{a}=k$. If $V=\left|abc\right|$, find the value of V^2+10. (6 points)

18. From the diagram below, $ABCD$ is a square. The arc AC is one-quarter of the circumference of a circle. If the circle with center O has a radius of 1 unit and the area of the shaded region is $k\pi$, then find the value of $10k$. (Given that $\sqrt{2}\approx 1.4$ and $\sqrt{3}\approx 1.7$) (6 points)



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19. A man uses a truncated cone-shaped container with a base radius of 20 centimeters, a top radius of 30 centimeters, and a height of 30 centimeters to scoop water from a water source 10 meters away from his house. He then fills a cylindrical tank with a radius of 50 centimeters and a height of 1.2 meters. If he spills 1% of the tank's volume of water every 1 meter he travels, what is the minimum number of times he needs to fetch water to fill the tank to over 80% capacity? (6 points)

20. A box contains $n+1$ balls, each numbered from 0 to n. Three balls are randomly selected from the box one by one without replacement. The total number of possible ways to select the three balls is 6,840.
Let a be the number of ways such that the sum of the numbers on the first two balls drawn equals the number on the third ball and let b be the number of ways such that the numbers on all three balls are prime numbers. Find the difference between a and b.
(6 points)

21. Let A be the sum of all real solutions x to the equation $(x^2-5x+5)^{x^2-11x+30}=1$,
Find the value of $10A+5$. (2.5 points)

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22. Let x and y are integers and satisfying the system

$x^2 + xy + y^2 = 2,217$,

$x^4 + x^2y^2 + y^4 = 2,906,487$.

Determine the value $\sqrt{xy + 31}$. (4.5 points)

23. A right circular cone has a height of 12 units and a base radius of 5 units. A sphere is inscribed inside the cone such that it is tangent to the base and the lateral surface of the cone. Find the radius of the sphere. (2.5 points)

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24. Let $ABCD$ be a rectangle with side lengths $AB = 20$ units and $BC = 15$ units. A circle is inscribed within triangle ABC. This incircle is tangent to the diagonal AC at point P and tangent to the side BC at point Q. Find the ratio of the area of incircle to the area of the rectangle $ABCD$. (Given $\pi = \frac{22}{7}$.) (4.5 points)

25. Let n be any positive integer such that $n!$ has a total of 160 factors, where $n!$ represents the product of all positive integers from 1 to n. If a factor is chosen at random, the probability that this number is not a prime factor of $n!$ is 0.975. Find the value of n. (4.5 points)

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GRADE 9 ANSWER KEY

No.	Answer	No.	Answer
1	32	14	66
2	5	15	360
3	6.25	16	405.1
4	57	17	18
5	8	18	47.25
6	100	19	15
7	225	20	174
8	71	21	215
9	2	22	22
10	850	23	3.33
11	20	24	0.26
12	70	25	9
13	4.62		

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