1. Suppose that $\left(\sqrt[4]{216}+\sqrt{6}+\sqrt[4]{6}+1\right)^2=\dfrac{a}{\sqrt{b}-2\sqrt[4]{b}+c}$, find $a+b+c$.

2. Find the value of $2025\sqrt{\dfrac{2024^2-2025\times 2023}{625}}$.

3. What is the sum of the digits of the integer equal to $7777777^2-2222222^2$?

4. How many pairs of integers (x,y) are there, satisfying the equation $2x^2y+5xy+y=13$?

5. How many positive integers n are there such that $n-3$ divides $n^3+11n-15$?

6. Four natural numbers added three at a time give sums 115, 203, 275 and 292, respectively. What is the largest of the four numbers?

7. The ratio of Daisy's age to Mangkorn's age 7 years ago was 3 : 8. Mangkorn is now 47 years old. How old is Daisy?

8. Tom started at point A and walked 8 meters south, 13.5 meters west and a further 10 meters south to arrive at point B. Jerry started at the point A and walked in a straight line to the point B. How much further did Tom walk than Jerry? (Give your answer in meters.)

9. There are fifty people in the cinema. If two new men enter the cinema, there will be three times as many men as women. What is the product of the number of men and women in the cinema?

10. If $a_1+a_2+a_3=3,\ a_2+a_3+a_4=4,\ a_3+a_4+a_5=5,\ a_4+a_5+a_6=6,\ \ldots$ $,a_{98}+a_{99}+a_{100}=100$ where $a_1+a_2+a_{100}=101$ and $a_1+a_{99}+a_{100}=102$, respectively. Find $\sum_{i=1}^{100}\frac{a_i}{3}$.

11. An isosceles triangle has two equal sides of length 25 units, and these sides are longer than the other side. If the area is equal to 168 unit^2, what is the perimeter of this triangle?

12. In Triangle ABC, M is the mid-point of side AB. The lengths of the sides MC, AC, BC are 7, 10, 24 respectively. Find the length of AB.

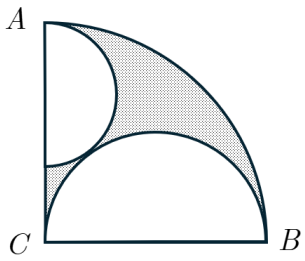
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In Triangle ABC, M is the mid-point of side AB. The lengths of the sides MC, AC, BC are 11, 12, 26 respectively. Find the length of AB.

13. Let $\square ABCD$ be a rhombus. Points P and Q are on the sides AB and AD, respectively. If $3\overline{AP} = 2\overline{PB}$ and $3\overline{AQ} = 7\overline{QD}$, then find the ratio of the area of the triangle CPQ to the area of the rhombus $ABCD$. (Answer in 2 decimal places.)

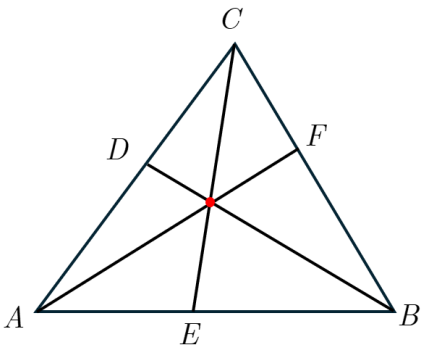
14. Find the area of an inscribed circle in a triangle whose sides are 24 units, 26 units, and 30 units long.

15. In the given figure, a quarter circle of radius 14 units has two semicircles inside. These two semicircles are tangent to each other. The radii of each semicircle are on the radii AC and CB, respectively. Find the area of the shaded region. (Answer in 2 decimal places.)



16. Peter and Jane want to make piles of sand in the shape of a cone. Each person makes one pile whose height is twice its radius and the length of the radius is integer. If the volume of used sand is $\frac{17908}{21}$ cubic unit, then find the difference between the radii of Peter's pile and Jane's pile.

17. In the figure below, let side lengths of ΔABC be integer. Suppose that the perimeter of ΔABC equals 26 unit long an $|\overline{BE}| = |\overline{DC}| = 4,\ 2|\overline{CF}| = |\overline{BF}| = 6,$ where $|\overline{BE}|$ is the length of the side $\overline{BE}$. Let k be the ratio of the area of ΔACE to the area of ΔABD. Find the value of $84k$.



18. Robinhood joins the 'APPLESHOOTING' challenge. An apple will be thrown upward from a throwing point at a constant speed. A participant stands 480 meters away from the throwing point. Suppose that Robinhood takes 3 second for aiming and after that shoots an arrow with speed 120 m/s. If the arrow can hit the apple in 5 second, then find the speed of the apple.

19. In math class, there are 40 students and a teacher finds the average score to be 53.25. While he is rechecking the data, he finds that he input the wrong score. He added 7 instead of 70 and 89 instead of 36. What is the correct average score?

20. A teacher has 14 identical cakes. He wants to give all of them to his 3 students and no one gets no cake. If the number of cakes of each student is an even number, how many ways can he give cakes to his students?

21. If $a^b = 4$, then what is $5\left(\frac{1}{a}\right)^{-2b} + 2a^{-b}$?

22. Find the largest integer smaller than $\sqrt{2024+\sqrt{2024+\sqrt{2024+\sqrt{2024}}}}$.

23. Suppose that a triangle has the following properties:

    1. The length of each side is an integer.
    2. The perimeter is 2024.
    3. The triangle is isosceles.

    How many possible triangles are there?

24. A running track consists of two straight segments joined by semi-circular ends. The diameter of the semi-circular is 70 meters. If the total length of the track is 678 meters, determine the length of a straight segment.

25. In two dice are thrown, if $\frac{a}{b}$ is the probability of 5 appearing on at least one of the dice, find the values of $3a+b$.

GRADE 9 ANSWER KEY

ข้อ	คำตอบ	ข้อ	คำตอบ
1	32.00	14	176.00
2	81.00	15	42.78
3	63.00	16	3.00
4	3.00	17	60.00
5	7.00	18	45.00
6	180.00	19	53.50
7	22.00	20	15.00
8	9.00	21	80.50
9	481.00	22	45.00
10	583.33	23	505.00
11	64.00	24	229.00
12	34.00	25	69.00
13	0.41		

***หมายเหตุ ข้อ 12 คณะกรรมการตัดสินให้คะแนนฟรี เนื่องจากโจทย์ไม่สมบูรณ์