1. The number A, B and C are given by $A=\sqrt{9-6\sqrt{2}}-\sqrt{9+6\sqrt{2}}$,
$B=\sqrt{9-3\sqrt{5}}-\sqrt{9+3\sqrt{5}}$ and $C=\sqrt{13-3\sqrt{17}}-\sqrt{13+3\sqrt{17}}$. Find $\sqrt{ABC}$.

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$B=\sqrt{9-3\sqrt{5}}-\sqrt{9+3\sqrt{5}}$ and $C=\sqrt{13-3\sqrt{17}}-\sqrt{13+3\sqrt{17}}$. Find $\sqrt{|ABC|}$.

2. Let $f(x)=3x+\sqrt{4x^2+1}+\dfrac{1}{2x-\sqrt{4x^2+1}}$, find $f(2024)$.

3. Given a matrix $A=\left[a_{ij}\right]_{m\times n}$ and A is the product of two given matrices defined by $A=\begin{bmatrix}1 & 5 & a\\ 2 & 6 & -2\\ 4 & 7 & 4\end{bmatrix}\begin{bmatrix}b & -4\\ 1 & 2\\ 3 & 5\end{bmatrix}$. If $a_{11}=-2$ and $a_{31}=51$, find $(a+b)^3$.

4. Find the values of $\dfrac{1}{20}\left[x^2y^2+(x+y)^2+(x-y)^2\right]$, if x and y are positive number satisfy $\left(\dfrac{x-y}{x+y}\right)^2=5$ and $\left(\dfrac{xy}{x+y}\right)^2=40$.

5. If $\tan\left(\frac{7\pi}{12}\right)=a-\sqrt{b}$, find $(a+b)^2$.

6. What is $5x^y+75x^{-2y}$, if $\log_x 5=y$.

7. Find the greatest power of 3 which is a factor of $30!$ is 3^k.

8. A man purchased 100 kg of apples at the rate of 55 baht per kg. He sold 25% of all apples at the rate 60 baht per kg. After that there is 15 kg of rotten apples. At what rate must he sell the remaining apples per kg to make a profit of 35% on the sale of all apples?

9. Let x,y,z be real numbers.
If $5x^2+2y^2+2z^2=6xy-2xz$ and $2x+y-3z=40$,
then find the value of $\left|xy+z^2\right|$.

10. In a class, 50 students choose to study both chemistry and mathematics. Three times as many students choose to study mathematics than chemistry. Two times as many students choose to study chemistry than choose to study neither subject. More than one student is choosing to study chemistry only. What is the number of students who choose to study both subjects?

11. In the triangle ΔABC, a,b,c are the length of sides that are opposite to angle $A,B,$ and C, respectively. If $\frac{a}{c-b}+\frac{c}{b+a}=-1$, find the degree of $\widehat{ABC}$.

12. Peter leans a 3.9 meter-long ladder against a vertical wall, at which the bottom of the ladder is 150 centimeters away from the base of the wall. After that, the ladder moves down the wall resulting in the bottom of the ladder being 360 centimeters away from the base of the wall. How many centimeters does the ladder slide down from the wall?

13. Find the area in the xy-plane containing the point (x,y) that makes the inequalities $xy^4-2xy^3-x^3y^2+2x^2y^2\le 0$ and $0\le x\le y$ are true.

14. Let m,n be integers. Suppose that (m,n) is a point that is in the region covered by $x=-\pi, y=\pi^2$, and $y=2x+5$. How many points (m,n) are there?

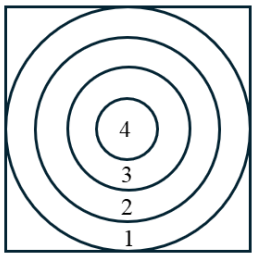
15. Suppose that the straight line $y=\sqrt{3}x$ is tangent to a circle at $x=\frac{3\sqrt{3}}{2}$. The center of a circle is on y-axis. Find the distance between the origin point and the center of a circle.

16. Let $\frac{p}{q}$ be the probability of rolling two dice and getting the sum of numbers on two dice is a prime number, where $\gcd(p,q)=1$. Find the value of $\frac{(q-p)(p^2+pq+q^2)}{10}$.

17. Find the value of $(2^5)+(2^4)\binom{5}{1}+(2^3)\binom{5}{2}+(2^2)\binom{5}{3}+(2)\binom{5}{4}$.

18. A bag contains 200 marbles of three colors (red, blue, and green).
Two marbles are picked at random, one after the other, without replacement. The probability of picking two green marbles is $\frac{703}{19900}$. The probability of picking at least one red marble is $\frac{3996}{4975}$. How many blue marbles are there in a bag?

19. The square shooting target contains four different circles and different scores as shown below. The radii of each circle are 1 unit, 2 units, 3 units, and 4 units, respectively. If $k\pi$ be the probability of shooting an arrow two times and getting six scores, then find a value of $640k$. (Given $\pi = 3.14$.)

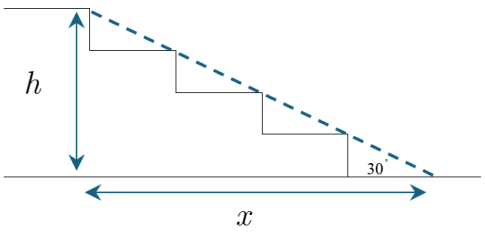


20. A dataset has a mean of 48. Five data are added to this dataset. The average of a new dataset is 45. If the sum of five data added is 165, how many data in the default dataset are there?

21. Today is Sandy's birthday. In the next 19 years, Sandy will be 9 times as old as she was 5 years ago. How old is Sandy in the present?

22. Find the value of $\cos^2 2^\circ + \cos^2 4^\circ + \cos^2 6^\circ + ... + \cos^2 88^\circ + \cos^2 90^\circ$.

23. The figure below shows the blueprint of the stairs on the first floor of a house. The height of the first floor is 2 meters. If the length of each step is 43.3 centimeters, how many floors of stairs are there? (Given $\sqrt{3} = 1.732$.)



24. There were ten couples at the party. If each shakes hands only once with each of the others, except their spouse, how many handshakes are possible?

25. The mean, median, and mode of four students' scores are $25, 26,$ and 30, respectively. What is the minimum score?

GRADE 10 ANSWER KEY

No.	Answer	No.	Answer
1	6.00	14	30.00
2	506.00	15	6.00
3	27.00	16	160.30
4	92.00	17	728.00
5	1.00	18	51.00
6	28.00	19	596.60
7	14.00	20	20.00
8	98.75	21	8.00
9	112.00	22	22.00
10	4.00	23	7.00
11	120.00	24	180.00
12	210.00	25	18.00
13	1.00		

***หมายเหตุ ข้อ 1 คณะกรรมการตัดสินให้คะแนนฟรี เนื่องจากโจทย์ไม่สมบูรณ์