

2019 Mu Alpha Theta Tennessee State Convention
Speed Math Competition

- Calculate $(2019)(1981)$
- What is $2^2 + 0^2 + 1^2 + 9^2$
- How many ways are there to arrange the letters W, X, Y, Z such that X comes before Y
- Calculate 11^4
- What is the sum of the first 25 odd numbers
- What is $\sqrt{19^2 + 180^2}$ as an integer?
- What is $(22! + 1) \bmod 23$?
- If $\frac{2019 \cdot 2019}{2^{19} \cdot 5^3}$ is expressed as a decimal, how many digits will be to the right of the decimal place?
- How many factors does 8640 have?
- How many of the first 200 counting numbers are divisible by 4 distinct prime numbers?
- Find the units digit of $3^{2019} + 4^{2019} + 5^{2019}$
- How many sides does a polygon have if the sum of its interior angles equals 3960 degrees?
- If the previous polygon was regular, what is the measure of one of the external angles?
- Maggie is going 69 miles per hour on the interstate. If the distance she travels in 26 seconds is x, and the distance she travels in 13 minutes is y, what is the ratio x/y written in terms of a common fraction?
- Suppose $x = \sqrt{5 + \sqrt{5 + \sqrt{5 + \dots}}}$. Let x be expressible in the form $\frac{a \pm \sqrt{b}}{c}$. What is the value of $a + b + c$?
- If you expanded $(2x^3 + 3y^2)^4$, what would be the coefficient of the x^6y^4 term?
- What is the determinant of $\begin{bmatrix} 101 & 99 \\ 99 & 101 \end{bmatrix}$?
- Let $4x^2 + 9y^2 - 24x + 72y + 144 = 0$ be an ellipse. What is the center of this ellipse?
- In Roselandia, white roses have 5 petals and red roses have 3 petals. If Juniper B. Jones, a petal collector, has 17 petals in her basket, how many flowers did she pick?
- What is $(10e * \sin(3/5)^{4\pi})^{\frac{0}{0!}}$
- In how many permutations can the letters in WATSON be arranged?
- In how many permutations can the letters in HOLMES be arranged?
- Let #n denote the answer to problem n in this test. What is #21 + #20 - #22.
- What is the area under the curve $f(x) = \sin x$ from $0 < x < 2\pi$
- Evaluate $\lim_{x \rightarrow \pi} \frac{\sin x + \cos(\frac{x}{2})}{\pi - x}$

2019 Mu Alpha Theta Tennessee State Convention
Speed Math Competition

Speed Math Answer Key

1. 3999639
2. 86
3. 12
4. 14641
5. 625
6. 181
7. 0
8. 19
9. 56
10. 0
11. 6
12. 24
13. 15
14. $\frac{1}{30}$
15. 24
16. 216
17. 400
18. (3,-4)
19. 5
20. 1
21. 720
22. 720
23. 1
24. 0
25. $\frac{3}{2}$