Algebra 2-- Team Question #1   Regional 1999

Find the positive integer whose cube exceeds its square by 4624.

Algebra 2-- Team Question #2   Regional 1999

Find the positive value of x that satisfies $4^{\log_2 x} + x^2 = 8$.

Algebra 2-- Team Question #3   Regional 1999

Mrs. Selph and Mrs. Hiller bought sticks of gum for 1 cent each, tootsie rolls for 10 cents each, and candy bars for 50 cents each. They spent $5 and got 100 items. How many sticks of gum did they buy?

Algebra 2-- Team Question #4   Regional 1999

If $a < b$, find the ordered pair of positive integers (a,b) that satisfies $\sqrt{10 + \sqrt{84}} = \sqrt{a} + \sqrt{b}$

Algebra 2-- Team Question #5   Regional 1999

If $a + \dfrac{1}{a} = 3$, find the absolute value of $a - \dfrac{1}{a}$.

Algebra 2-- Team Question #6   Regional 1999

Solve for x: $\dfrac{|x - 2|}{x} > x$.

Algebra 2-- Team Question #7   Regional 1999

Write $\dfrac{\sqrt{2}}{\sqrt{2} + \sqrt{3} - \sqrt{5}}$ with a rational denominator.

Algebra 2-- Team Question #8   Regional 1999

Solve the equation $\log_{2x} 216 = x$, where x is real.

Algebra 2-- Team Question #9   Regional 1999

Solve for x > 0: $e^{x^{e^{x^{e^{x}}}}} = 2$.

Algebra 2-- Team Question #10   Regional 1999

If $\ln x^4 = (\ln x)^3$, find all solutions for x.

Algebra 2-- Team Question #11   Regional 1999

The population of Flatland at one time was a perfect square. Later, with an increase of 100, the population was one more than a perfect square. Now, with an additional increase of 100, the population is again a perfect square. What was the original population of Flatland?

Algebra 2-- Team Question #12   Regional 1999

Find the exact value of the first of 100 consecutive odd integers whose sum is 100^{100}.

Algebra 2-- Team Question #13   Regional 1999

In a simple code, each letter of the alphabet is assigned its numerical position in the alphabet. A one-word code was received in this code, but was lost. All we know is that the message had the form x, x + 7, x + 6, x + 5, that the second letter was a vowel, and that the word was an English word. What was this one-word message?

Algebra 2-- Team Question #14   Regional 1999

Mr. Magoo forgot how many children he has. But, he does know that if he adds the number of children to its square, squares the result, and then subtracts the fourth power of the original number, he obtains the same result as the one obtained if he adds the original number to its square, subtracts 3, and then multiplies by 12. How many children does Mr. Magoo have?