Evaluate each of the following and find the sum (only turn in the answer for the sum):

a) $\log_3 243$ b) $\log_2 4\sqrt[3]{2}$ c) $\log_7 \frac{1}{343}$

d) $\log_{1/2} \frac{1}{8}$ e) $\log_9 27$ f) $\log_{\sqrt{5}} 125\sqrt{5}$



Suppose $h(2z+3) = \frac{5-2z}{4+z}$, then find the value of $A+B$ if

$A = h(-9)$ $B = h^{-1}(4)$



Find the value of A + B if

$$A = 1 + \cfrac{8}{2 + \cfrac{8}{2 + \cfrac{8}{2 + \cfrac{8}{2 + \ldots}}}}$$

$$B = 3 + \cfrac{1}{2 + \cfrac{1}{3 + \cfrac{1}{2 + \ldots}}}$$



Find the sum of all real solutions to A and B, if

$A$ is $\sqrt{4x+1} - \sqrt{x-11} = \sqrt{2x-4}$ $B$ is $\sqrt[3]{x^3 - x^2 - 10} = x - 1$

Theta School Bowl Question #5 2010 MAΘ National Convention

Find the value of $A + B$ if:

$$A = (1000 - 998) + (998 - 996) + (996 - 994) + \ldots + (334 - 332)$$

$$B = 900 - 841 + 784 - 729 + \ldots + 36 - 25 + 16 - 9 + 4 - 1$$

Theta School Bowl Question #6 2010 MAΘ National Convention

If M and D are defined as shown, what is the value of P, where $\frac{M}{D} = 3^P$ ?

$$M = 3^{2^{2^{2^2}}} \qquad D = \left(\left(\left((3)^2\right)^2\right)^2\right)^2$$

Theta School Bowl Question #7 2010 MAΘ National Convention

Out of 200 fish in an aquarium, 99% are guppies. Let A = the number of guppies that must be removed so that the percent of guppies in the aquarium is 98%.

Buses leave a terminal every 37 minutes starting at 5:15 AM. You arrive at the terminal at 8:40 AM. Let B =the sum of the hour and the minute (in the morning) that the next bus will leave after you arrive.

Find the value of A + B.

Theta School Bowl Question #8 2010 MAΘ National Convention

If the mean, median, and mode for this set of data are all equal, then determine the value of A.

$$\{30, 80, 50, 40, A\}$$

Let B = the sum of the following series: $8^0 + 8^{1/3} + 8^{2/3} + 8^1 + 8^{4/3} + \ldots + 8^3$

Find the value of A + B.

Theta School Bowl Question #9 2010 MAΘ National Convention

I can finish the problems in one chapter of my book in 8 hours. Suppose the problems in each chapter take the same amount of time to solve and that there are 30 chapters. Let A = the number of people working together at the same rate as me that it would take to finish the whole book in one day.

Each good worker can paint my house alone in 12 hours. Each bad worker can paint my house alone in 36 hours. I need my house painted in 3 hours. If I can only find 3 good workers, then let B = the number of bad workers that I must also find in order to have my house painted on time.

Find the value of A + B.

Theta School Bowl Question #10 2010 MAΘ National Convention

Let A = the sum of all $x$ such that $\frac{10}{x^2}+\frac{22}{x}+4=0$

Let B = the sum of all $x$ such that $2x^4-5x^2+2=0$

Let C = the sum of all $x$ such that $\frac{x-6}{x-5}=\frac{4}{x-2}$

Let D = the sum of all $x$ such that $\frac{x^2-9x+8}{x-1}+\frac{3x^2+x-2}{3x-2}=-3$

Find the value of A + B + C + D.

Theta School Bowl Question #11 2010 MAΘ National Convention

Let A = $(2i)^2+(-3i)^3$ Let B = $i^{600}+i^{599}+\ldots+i+1$

If C is real and the product $(C+6i)(5-3i)$ is a real number, then use this value of C and

Find the value of A + B + C.

Theta School Bowl Question #12 2010 MAΘ National Convention

The tail of a 1-mile long train exits a tunnel exactly 3 minutes after the front of the train entered the tunnel. If the train is traveling at 60mph, then A = the length of the tunnel.

Superman and Flash are running around the world in opposite directions. Superman can go all the way around the world in 2.5 hours and Flash can do the same in 1.5 hours. If they start at the same time and same place, then let B = the number of times they will pass each other going in opposite directions in a 24-hour period.

Find the value of A + B.

Theta School Bowl Question #13 2010 MAΘ National Convention

If $f(x) = ax^4 - bx^2 + x + 5$ and $f(-3) = 2$, then let A = $f(3)$.

If $f(x) = 3x^2 - 7$ and $g(f(4)) = 9$, then let B = $g(f(-4))$.

If $f(x) = 2x - \frac{6}{x}$, then let C = the sum all values of $p$ such that $f(p) = -4$.

Find the value of A + B + C.

Theta School Bowl Question #14 2010 MAΘ National Convention

A parabola has its vertex at (4, -5) and meets the x-axis at two points that are on opposite sides of the y-axis. If this parabola has the equation $y = ax^2 + bx + c$, then

Let L = the number of coefficients from $a, b,$ or $c$ that **must** be positive

Let M = the number of coefficients from $a, b,$ or $c$ that **must** be negative

Find the value of L – M.