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1) If $\sqrt{3(\sqrt[3]{9(\sqrt[4]{27})})}$ can be expressed in the form 3^x , and x can be expressed as a fraction, then find the sum of the numerator and denominator of x .

2) Write as an ordered triplet (x, y, z) :

$$\begin{cases} 2x + 2y = 12 + z \\ 3x - y + 2z = 21 \\ x - 3z = 0 \end{cases}$$

3) $7^x = (13 + y)^z$, Find $(x + y + z)^2$, If $x = -5 + (6 - 8)^2 + 4 = z$.

4) Find $(2A + B - C + 3D)$ if A, B, C, & D are as follows:

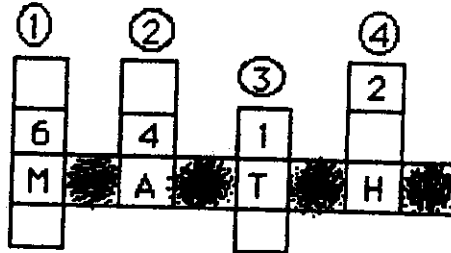
A is the least solution of $x^2 + 5x + 6 = 0$

B is the slope of the line $2y - 7x = 13$

C is the value of $[-3^2 + 2(2 - 5)^2]^3$

D is the value of $F(-2)$ for $F(x) = 2x^3 - 5x + 3$

5) Find $M^2 + A - T + H^2$



One Down: The y intercept of $y = (x - 5)^2(x + 3)(x - 7)^2$

Two Down: The total number of positive factors of 1280664.

Three Down: Solve $\left\lfloor \left[3 - 4^2(6 - 2^2)^3 \right] - 5 \right\rfloor$

Four Down: The sum of 3 consecutive odd positive integers, if 2 times the smallest is 81 more than the largest.

6) Find the distance between 2 points if the first point is the midpoint of $(4, 3)$ and $(9, 5)$ and the second point is one third of the distance from $(6, -2)$ to $(5, 4)$. LEAVE IN SIMPLEST RADICAL FORM

7) If three red dots are equal to two blue dots and four red dots are equal to five yellow dots and three blue dots are equal to seven green dots, then how many yellow dots are equal to eight green dots ?

8) Find the value of y in the following system:

$$\begin{cases} 2z - 2y = 6 - 2x \\ x + 3y + 2w = z - 1 \\ x = 8 - z \\ 4y + 5w = 4 + 2z \end{cases}$$

9) Write the equation with integral coefficients of the 4th degree polynomial equation if 3 of the four roots are 5 , -1 , and $2 + \sqrt{3}$.

10) Find the rational solutions of the following system:

$$\begin{cases} x^2y^2 + xy = 6 \\ x + 2y = 5 \end{cases}$$

11) Find $(A + B)^2$ $A = (\sqrt{3}) + 7 - \frac{2}{3} - 3\sqrt{11} + 2\sqrt{6} - 4 + 10$
 $B = \sqrt{99} - 4 + (\sqrt{5}) - \sqrt{24} + 1 + 5 + 2 + (\sqrt{6})$

12) Simplify: $\frac{(2x + 2y)(x^{-1} - y^{-1})}{(x - y)(x^{-1} + y^{-1})}$

13) Simplify: $\left(\frac{1 + \sqrt{2}}{3}\right)^{16}$

14) Find the perimeter of the polygon formed by the vertices of $(3, 4)$, $(-1, -2)$, and $(5, 1)$.

15) If A is the sum of the solutions and B is the product of the solutions then find A/B for the equation $6x^2 + 5x - 8$.