ALGEBRA I TEAM QUESTIONS JANUARY REGIONAL

1) If $2(5 - x) + 6x = x + 22$ and $6(y + 4) - (y + 3) = y - 1$ **find** $x + y$

2) Jason has \$15.17 in pennies, nickels, dimes, and quarters. If he has an equal number of each coin, then how many coins does he have altogether?

3) Let x = the sum of the first 6 prime numbers
y = the sum of the positive integral factors of 30
z = the sum of the first 7 positive odd integers

Express as a reduced fraction: $\frac{x - z}{y}$

4) Name two whole numbers, neither containing any zeros, which when multiplied together produce a product of exactly 80,000.

5) What is the sum of all the solutions to the following equations:

$6x^2 - x - 12 = 0$ $3x^2 + 14x - 24 = 0$

6) The denominator of a fraction exceeds the numerator by 10. If 2 is subtracted from the numerator, and the denominator is unchanged, the resulting fraction has a value of $\frac{3}{5}$. Find the original fraction.

7) Simplify: $\dfrac{x + 3 + \frac{5}{x - 3}}{x + 2 + \frac{4}{x - 3}}$

8) Write in slope intercept form the equation of the line which contains the point $(-3, 4)$ and which is perpendicular to the line $3x + 2y = -1$.

9) If $A * B = 4A^2 - 12AB + 9B^2$, find the value of $(5 * 3) * (4 * 2)$

10) What is the power of x in the simplified expression for:

$$\frac{(x^2y^{-3}z^5)^{-3}}{(x^{-5}y^{-2}z^4)^2} \cdot \frac{(x^7y^{-3}z)^2}{(x^3y^{-4}z^{-3})^{-1}} \cdot \frac{(x^6y^2z^{-3})^3}{(x^5y^{-4}z^5)^0}$$

11) Name the smallest positive integer which leaves a remainder of 3 if it divided by any of the following numbers: 4, 5, 6, 7, or 8.

12) Solve each equation for the unknown.
Then find the value of **2A - B + C - 2D.**

$7A + 5 = 15$ $\qquad$ $3(C + 5) = 4(2 - C)$

$\frac{B - 7}{3} = -4$ $\qquad$ $D - \frac{D}{8} = \frac{5}{4}$

13) The area of a square is represented by $x^2 + 28x + 196$.
Write an expression for the perimeter of the square.

14) What is the coefficient of the quadratic term of the quotient :

$$(4x^5 - 6x^4 - 3x^2 + 8x + 5) \div (2x - 1)$$

15) Name the sum of the 5 integers described below:

There are 3 consecutive integers such that twice the smallest is 51 more than the largest.

There are 2 consecutive odd integers such that 4 times the larger is 85 more than 5 times the smaller.