MIAMI KILLIAN - MIAMI SUNSET INVITATIONAL JANUARY 9, 1993

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ALGEBRA 2 TEAM

QUESTION # 1

Solve:

$$\begin{cases} x - 3y - z = 1 \\ -2x + y + 4z = 12 \\ -x - y + 3z = 5 \end{cases}$$

QUESTION # 2

Let A = the y-intercept of $5x - 3y - 11 = 0$

Let B = the slope of the line perpendicular to $11x + 2y - 3 = 0$

Let C = the slope of the line parallel to $8x - y - 2 = 0$

Let D = the x-intercept of $4x + y - 8 = 0$

Find: $\dfrac{A+D}{B+C}$

QUESTION # 3

$f(x) = x^2 + 25$

$g(x) = x - 5$

Find x if $f(g(x)) - g(f(x)) = 22$

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QUESTION # 4

$A = 3 - 2i$

$B = 5 + 3i$

$C = 5 - i$

$D = 13 - 3i$

Find: $(\overline{A} - \overline{C})(D - \overline{B})$

QUESTION # 5

Find: $a + b + |c|$ if

$$\begin{vmatrix} 1 & 4 \\ a & -2 \end{vmatrix} = 3$$

$$\frac{5}{b-3} - \frac{8}{b+4} = 0$$

$$c^2 = 4^{-4}$$

QUESTION # 6

Solve:

$$2 \leq |18 - 2x| < 28$$

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QUESTION # 7

If $f(x) = x^2 + 3$, then find: $\frac{f(2 + h) - f(2)}{h}$

QUESTION # 8

If $\frac{x + 8}{x^2 + x - 6} = \frac{A}{x + 3} + \frac{B}{x - 2}$, then find the values for A and B

QUESTION # 9

A container has 4 gallons of a 25 percent chlorine solution. How many gallons must be removed and replaced with a 75 percent cholorine solution to have the container contain 4 gallons of a 60 percent solution?

QUESTION # 10

Find the value of x for which: $8^{\log_2 x} + x^3 = 128$

QUESTION # 11

What is the sum fo all values of x that make the following true?

$|x + 5| = 3|x - 2|$

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QUESTION # 12

If 2 and 2 + *i* are two roots of a cubic equation with real coefficients, what is the equation?

QUESTION # 13

THE SUM OF TWO NUMBERS IS 15. THE PRODUCT OF THEIR RECIPROCALS IS $\frac{1}{56}$. FIND THE SUM OF THEIR RECIPROCALS.

QUESTION # 14

Simplify and write in the form of a + b*i*

$$\frac{5 + 4i}{3 - 7i} \div \frac{2 + i}{3 - 2i}$$

QUESTION # 15

Find the sum of the numerical coefficients in the expansion of $(a + b)^8$.