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East Bay

ALGEBRA I
REGIONAL COMPETITION - 9 MARCH 1991
TEAM QUESTION 1

EVALUATE: $1991^2 - 1990^2$

TEAM QUESTION 2

If $3(5 - 2a) = 7 - (5a + 1)$ and $3b - 2(4b + 4) = 6 - 2(b - 2)$
find $a + b$.

TEAM QUESTION 3

Name two whole numbers, neither containing any zeros, which when multiplied together produce a product of exactly 1,000,000.

TEAM QUESTION 4

Jessica has \$10.92 in pennies, nickels, dimes, quarters and half dollars. If she has an equal number of each coin, then how many TOTAL coins does she have?

TEAM QUESTION 5

EVALUATE:
$$\frac{1000^2}{(254^2 - 246^2)}$$

TEAM QUESTION 6

From the equations given below name the product of xyz .

$$\frac{x - 4}{8} + \frac{x + 2}{3} = \frac{x + 4}{4}$$

$$\frac{7y - 1}{5} - \frac{5y + 3}{6} = \frac{4y + 3}{10}$$

$$\frac{3z - 1}{4} - \frac{5z + 7}{8} = \frac{2z + 3}{2}$$

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TEAM QUESTION 7

If a = the sum of the Least Common Multiple (LCM) and the Greatest Common Factor (GCF) of 12, 18 and 10

And b = the sum of the Least Common Multiple (LCM) and the Greatest Common Factor (GCF) of 60, 24 and 15

Name the value $a + b$.

TEAM QUESTION 8

From the systems of equations given below, name the product of their solutions, that is name $abcd$.

$$3a + 2b = 19$$

$$4a - 5b = 10$$

$$4c + 5d = 3$$

$$5c + 2d = 8$$

TEAM QUESTION 9

Name the sum of all the solutions to the equations given below

$$2x^2 - 7x - 72 = 0$$

$$4x^2 - 20x + 9 = 0$$

TEAM QUESTION 10

Name the sum of all the integers that satisfy both inequalities given below.

$$16 + 2(5 + 7x) > -16$$

$$19 - 3(9 + 8x) \geq -80$$

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TEAM QUESTION 11

Name the sum of the remainders for the division problems given below.

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

$$(x^3 - 18x - 42) \div (x - 5)$$

$$(4x^3 + x + 7) \div (2x + 3)$$

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TEAM QUESTION 12

Name the sum of the five integers described below:

There are two consecutive odd integers such that three times the smaller is nine more than twice the larger.

There are three consecutive even integers such that six times the largest equals twice the smallest.

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TEAM QUESTION 13

Name the sum of the lengths of segment AB and segment CD.

- A (-12,-12)
- B (-5,12)
- C (2,-13)
- D (-13,7)

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TEAM QUESTION 14

Name, in lowest terms, the product of the slopes of the lines whose coordinates are solutions for the equations given below.

$$3x - 2y = 12$$

$$-2(8x - 6y) = 24$$

$$\frac{x}{4} + \frac{y}{8} = 5$$

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TEAM QUESTION 15

Name the sum of the present ages of Larry, Patty, John and Jill.

The sum of 6 times Jack's age and 5 times Larry's age is 63. Jack is 1 year less than 3 times as old as Larry.

The sum of 6 times Patty's age and 8 times Kathy's age is 162. Kathy is 1 year more than twice as old as Patty is.

The sum of 3 times John's age and 2 times Jill's age is 54. Jill is 8 years less than twice as old as John is.