

ALGEBRA 1

TEAM QUESTIONS

Plant
MARCH '97

- 1: The night of Jan's party, her doorbell rang 10 times. The first time, one guest arrived. Then each time the doorbell rang, 2 more guests arrived than had arrived on the previous ring. How many guests were at Jan's party?
- 2: Find the average of the roots of the equation $2x^2 + 14x + 17 = 0$.

3: Simplify:
$$\frac{4 + (2+6)^2 - \frac{2}{3} + 6 \div 2 + 9^2}{\frac{3}{4} - \frac{2}{3} + 7^2 - 4^2 + 3^2}$$

Round your answer to 3 decimal places.

4: Let point A be the solution of
$$\begin{cases} 4x - 3y = -20 \\ -x - 8y = 5 \end{cases}$$

and let point B be the solution of
$$\begin{cases} 7x - 3y = -5 \\ 3x + 2y = 11 \end{cases}$$

Find the midpoint of A and B.

5: Find n if $2^{n+3} \cdot 2^{3n-2} \cdot 2^{5n+1} = 32$

6: If $f(a) = (2a + 3)^2$ and $g(a) = \sqrt{a} - 5$, find the sum of the values of a so that $g[f(a)] = 8$.

7: Solve the following equations to find the value of $B^2 - 4AC$

$$2.2A - 4.8 = 3A + 7.6$$

$$18 = 5B + 3$$

$$\frac{2C}{3} - \frac{1}{3} = \frac{3C}{4} + \frac{1}{2}$$

$$\frac{1}{3}D - 2 = 5 + \frac{1}{2}D$$

8: Ned is 2 years older than Mike, who is twice as old as Linda. If the ages of the three total 27 years, how old is Mike?

9: Solve for Z:

$$\frac{1}{x-y} + \frac{2}{y-x} + \frac{3}{x-y} + \frac{4}{y-x} + \frac{5}{x-y} + \frac{6}{y-x} + \frac{7}{x-y} + \frac{8}{y-z} = \frac{Z}{x-y}$$

10: For all numbers a and b , the operation $a * b$ is defined by $a * b = ab - a + b$. Find the solution of the equation $5 * x = 19$.

11: Find the sum of the mean, median and mode of the following set of data.

4, 7.2, 4, 9, 21, 15, 6, 6.3, 29, 0

12: Given $A = 280$
 $B = 528$
 $C =$ the greatest common factor of A and B
 $D =$ the least common multiple of A and B

Find: $\frac{(A)(B)}{(C)(D)}$.

13: Find the sum of the perimeter and area of the polygon with vertices at

$A(-5,6)$, $B(7,-3)$ and $C(-5,-8)$.

14: Evaluate: $1 + \left[2 - \left[3 + \left[4 - 5 \right]^{-1} \right]^{-1} \right]^{-1}$

Express your answer as a rational number.

15: If $W = \left[4(30 - 5) \right] \div \frac{10}{2}$, $X = \frac{12(15 + 3)}{(20 \cdot 5) - (20 \cdot 2)}$,

$Y = 5 + \left[4 \cdot 3(2 + 1) \right]$ and $Z = \left[\frac{6 \cdot 2(8 - 3)}{11 + 4} \right] \cdot 6$

Find $(2W + X - Y)Z$