QUESTION 1

Let

$$\begin{aligned} A &= 15\% \text{ of } \frac{3}{4} \text{ of } 10\% \text{ of } \frac{1}{2} \text{ of } 6400 \\ B &= 1! + 2! - 3! + 4! - 5! + 6! \\ C &= \text{the sum of the next three terms of the following sequence: } 0, 1, 1, 2, 3, 5, 8, 13, 21, 34 \ldots \\ D &= \text{the number of distinct prime factors of } 2015 \end{aligned}$$

Compute $A + B + C + D$.

QUESTION 2

Let

A = the sum of the x coordinate of the x-intercept of $y = \frac{4}{3}x - \frac{3}{4}$ and the y coordinate of the y-intercept of $y = 101x + \frac{7}{16}$

B = the distance between (40,35) and (70,75)

C = the slope of a line segment with end points (20,15) and (35,25)

D = the sum of the abscissa of (2,0) and the ordinate of (1,5)

Compute $A + B + 3C + D$.

QUESTION 3

Given the functions $f(x) = 3x^2 + 2x$ and $g(x) = x^3 - 4x^2 + 5$, let

$$\begin{aligned} A &= f(2) \\ B &= g(3) \\ C &= f(g(0)) \\ D &= g(f(1)) \end{aligned}$$

Find $A + B + C + D$.

QUESTION 4

Start with x = 0. For every true statement, add 20 to x. For every false statement, subtract 15 from x.

0 is a whole number
π is rational
vertical lines have undefined slopes
-1 is a natural number
20.15 is an integer

What is the final value of x?

QUESTION 5

Sid the Algebra Kid asks that you solve the following, and then calculate $M - A - T - H$ (M, A, T, and H represent distinct digits).

$$M123 + 4A56 + 78T9 = 1444H$$

QUESTION 6

Rithik wants you to use the following equation to solve for each of the following statements:

$$20x^2 + 15x + 10 = 0$$

A = the sum of the roots
B = the product of the roots
C = the degree of the polynomial
D = the positive difference between the leading coefficient and the constant term of the polynomial

Compute $4A - 2B + C + D$.

QUESTION 7

Determine the area of the figure bounded by the following inequalities:

$$x \geq -2$$
$$y \geq 2x + 5$$
$$y \leq -3x + 10$$

QUESTION 8

Joel needs help on his homework and wants you to evaluate the following:

$$\begin{aligned} A &= \left(\frac{(3x^3y^0z^{-1})}{(z^2y^0x)}\right)^{-5} \\ B &= \text{the maximum number of pizza slices that can be made using only 3 cuts} \\ C &= \text{the larger of the two solutions of } |20-x|+|-15|=16 \\ D &= \sqrt{117}+\sqrt{468} \text{ in simplest radical form} \end{aligned}$$

Compute $243A + B + C + D\sqrt{13}$.

QUESTION 9

Let

A = the number of pints in 3.5 gallons, given that 1 cup is half a pint, and that $\frac{9}{2}$ gallons is the same as 72 cups

B = the y coordinate of the y intercept of the equation $3x + 2y = 16$

C = the degrees, in Celsius, of 194 degrees in Fahrenheit, given F = 1.8C + 32

D = the units digit of 2015^{2015}

Subtract the GCF of A and C from the LCM of B and D. This result is your answer to this question.

QUESTION 10

Simplify the following expression:

$$(6x + 3y)^2 + (3x + 4y)^2 + (2x + 5y)^2 + (9x + y)^2$$

QUESTION 11

Pruthak has given you, the chosen team, each of the following:

$$\begin{aligned} f(x) &= x+1 \\ g(x) &= 2x+2 \\ h(x) &= 3x+3 \\ j(x) &= 4x+4 \end{aligned}$$

Using the fact that $x = 2015$, let:

$$\begin{aligned} A &= f(x) \\ B &= g(f(x)) \\ C &= h(g(f(x))) \\ D &= j(h(g(f(x)))) \end{aligned}$$

Compute $D - C - B - A$.

QUESTION 12

Let $x \star y = 20y - 15x$. For

$$\begin{aligned} A &= 20 \star 15 \\ B &= 25 \star 100 \\ C &= 50 \star 75 \\ D &= 15 \star 20 \end{aligned}$$

Calculate $\sqrt{A + B + C + D - 50}$.

QUESTION 13

Let

$$12_3 = A_{10}$$
$$10_{10} = B_3$$
$$201_5 = C_2$$
$$101_2 = D_5$$

Compute $\dfrac{(C-B)}{(D-A)}$.

QUESTION 14

Let

$$\begin{aligned} A &= 13^3 \\ B &= 19^{-2} \\ C &= 216^{\frac{1}{3}} \\ D &= 3125^{\frac{-2}{5}} \end{aligned}$$

Compute $361B + 50D + C + A - 191$.