ALGEBRA 2 TEAM QUESTIONS March Regional

1. Let $A = -3i^{79} - 12i^{142}$

$B = (3 - 2i)(3 + i)$

FIND $A + B$

2. Find the distance from the x-intercept of $4x - 6y = x + 24$ to the midpoint of the segment from $(-4, -3)$ to $(6, 11)$.

3. Let $ax^2 + bx - c = 0$ be a quadratic equation where

$a = (-3)^4 - 3(-5)^2$

$b = \text{LOG}_4\ 64$

$c = (-2)(-3)(-1)(-1)(-2)$

Find all the roots of the quadratic equation over the REALS.

4. Determine the area of a triangle formed by the linea $y = 2$ and $8x - 3y = -30$ and the Y-axis.

5. Find all points in quadrant II which are solutions of $y = x^2 - 4x - 12$ and $3x + y = 8$.

6. If $A = \begin{vmatrix} -2 & 5 & 8 \\ 4 & -1 & 6 \\ 2 & 7 & 9 \end{vmatrix}$ and $B = \begin{vmatrix} -3 & 4 & 1 \\ 2 & -3 & 2 \\ 0 & -1 & 8 \end{vmatrix}$

FIND AB.

7. <u>SIMPLIFY :</u> $\dfrac{2\sqrt[3]{3}}{3 - \sqrt[3]{9}}$

8. Find the equation of a circle with center at the vertex of $x^2 + 4x + 12y - 32 = 0$ and is tangent to the line $x = 4$.

9. SOLVE : $\log_4 X + 2 \log_6 Y = 9$

$2 \log_4 X - 3 \log_6 Y = -3$

Find the values of X and Y .

10. Find the sum of the reciprocals of the three roots of $2x^3 - 8x^2 + 12x - 20 = 0$.

11. Let K be the largest negative integer value such that $Kx^2 - 12x - 6 = 0$ has no real roots.

Let Q be the value such that 2 roots of $x^2 - 4x + (Q - 3) = 0$ have a difference of 2.

NOW find K + Q

12. Let A = the slope of $3x - 5y = x_2 + 2$
B = the y-intercept of $y = x^2 + 2x + 4$
C = the slope of a line perpendicular to $y = 3x - y + 7$
D = the y coordinate of the vertex of the conic $y = x^2 - 6x + 7$

Now find $\frac{AB - C}{D}$

13. Let A = the sum of the series $27 + 9 + 3 + \ldots$

B = the geometric mean of 14 and 56

C = the positive root of $6x^2 + 7x - 5 = 0$

Find the product of A, B and C

14. Let A be the intersection of $y = 2^x$ and $y = \left[.5\right]^x$

Let B be the midpoint of (-4,5) and (8, -13)

If A is (x1,y1) and B is (x2, y2) , FIND (x1 + x2)(y1 + y2)

15. Let A represent the units digit of 3^{35}

B represent the discriminant value of $4x^2 - 9x + 3 = 0$

C represent the sum of the roots of $9x^4 - 63x^3 + 3x - 27 = 0$

Find $A^2 - BC$