1-1. Solve $\mathbf{2^{16} = 16^{x}}$

1-2. Let T = TNYWR. Regular hexagon ABCDEF has area T. What is the area of triangle ACE?

1-3. Let T = TNYWR. A regular hexagon is inscribed in a circle of radius T. Six semi-circles are drawn exterior to the hexagon such that each edge of the hexagon is a diameter of a semi-circle. What is the area of the "flower pattern" formed by the union of the hexagon and the six semi-circles?

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2-1 Compute: $\mathbf{\log 4^{2^5} + \log 5^{4^3}}$

2-2 Let T = TNYWR. The point (32, T) is on a square whose four vertices are on the axes. If the side of the square equals $\mathbf{b\sqrt{2}}$**,** compute **b.**

2-3 Let T = TNYWR. Let R = T/4. For a certain value of n, the expressions $3n^2 + 4n - R$ and $2n^2 + 3n - R + 56$ equal the same prime number p. What is p?

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RELAY – NOV 2019, STL

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ANSWERS:

1-1. x=4 **1-2.** [ACE] = 2 **1-3. [flower] =** $\mathbf{6\sqrt{3} + 3\pi}$

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2-1. 64 **2-2.** 96 **2-3. 151**