1086-57-2182 **Aldo-Hilario Cruz-Cota*** (aldo.h.cruz.cota@gmail.com) and **Teresita Ramirez-Rosas**.

Finding Formulas for the Complexity of Riemann Surfaces.

The *complexity* of a branched cover of a Riemann surface M to the Riemann sphere S^2 is defined as its degree times the hyperbolic area of the complement of its branching set in S^2. The *complexity* of M is defined as the infimum of the complexities of all branched covers of M to S^2. We prove that if M is a connected, closed, orientable Riemann surface of genus $g \geq 1$, then its complexity equals $2\pi(m_{\min} + 2g - 2)$, where $m_{\min}$ is the minimum total length of a branch datum realizable by a branched cover $p\colon M \to S^2$. Also, we will explain why finding explicit formulas for the integer $m_{\min}$ is a difficult problem that is related to the classical Hurwitz existence problem for branched covers of the Riemann sphere. (Received September 25, 2012)