Meeting: 999, Nashville, Tennessee, SS 4A, Special Session on Universal Algebra and Lattice Theory

999-08-23 **Walter Taylor***, walter.taylor@colorado.edu. *Approximate identical satisfaction of equations.* Preliminary report.

If $\mathbf{A}$ is an algebra on a metric space $\langle A, d\rangle$ and if $\sigma \approx \tau$ is an equation of the appropriate type, then $\rho_{\mathbf{A}}(\sigma, \tau)$ denotes the sup of $d(\sigma^{\mathbf{A}}(\mathbf{a}), \tau^{\mathbf{A}}(\mathbf{a}))$, with $\mathbf{a}$ in the appropriate power of A. Let $\rho_{\mathbf{A}}(\Sigma)$ be the sup of $\rho_{\mathbf{A}}(\sigma, \tau)$ over all $(\sigma \approx \tau) \in \Sigma$, and let $\rho_A(\Sigma)$ be the inf of $\rho_{\mathbf{A}}(\Sigma)$ over all topological algebras $\mathbf{A}$ (of the correct type) that are based on the space $\langle A, d\rangle$. If A is compatible with Σ, then $\rho_A(\Sigma) = 0$, but the converse fails.

We shall mention some elementary results, examples and problems about $\rho_A(\Sigma)$. In some cases, it yields a conclusion sharper than non-compatibility: e.g., if $Y \subseteq \mathbb{R}^2$ is a union of three unit segments at 120-degree angles, and Λ is lattice theory, then $\rho_Y(\Lambda) \geq 0.25$. If Γ_2 is groups of exponent 2, then $\rho_{\mathbb{R}}(\Gamma_2) = \infty$. The quantity is not a topological invariant: if the angles of Y are made small, then $\rho_Y(\Lambda)$ approaches zero while $\mathrm{diam}(Y)$ remains 1. (Received June 28, 2004)