**PP36717. Proposed by Pirkuliyev Rovsen.**

Prove without softs:

$$\frac{2+e^2}{2+\pi^2} > \sqrt[3]{e^{2(e-\pi)}}.$$

**Solution by Arkady Alt**, **San Jose**,**California**, **USA**.

Let $h(x) := \dfrac{e^{\frac{2x}{3}}}{2+x^2}$. Since $h'(x) = \dfrac{2e^{\frac{2x}{3}}(x-1)(x-2)}{3(x^2+2)^2} > 0$ then $h(x)$ increase in $(2,\infty)$ and, therefore, $h(\pi) > h(e) \Leftrightarrow \dfrac{e^{\frac{2\pi}{3}}}{2+\pi^2} > \dfrac{e^{\frac{2e}{3}}}{2+e^2} \Leftrightarrow \dfrac{2+e^2}{2+\pi^2} > e^{\frac{2(e-\pi)}{3}}$.