**S.-T Yau College Student Mathematics Contests**

**Geometry and Topology, Team, 2014**

1. Let smooth map, show any top de Rham cohomology class ,we have
2. homomorphism, Show f must map boundary point to boundary point. ( closed unit disc)
3. Let be one-forms. Show linearly independent if and only if
4. Show every map

has degree 0

1. Proof any smooth map

has a fixed point

1. Let M be the closed surface generated by carrying a small circle with radius around a closed and knotted curve embedded in such that the center moves along and the circle is in the normal plane to at each point. Show that

Where H is the mean curature of M and is the area element of M