MATH 527: GEOMETRY/TOPOLOGY I

FALL 2006

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HOMEWORK # 9; November 20, 2006

Complex manifolds, Lle groups

Due on Monday November 27

42. Give a detailed proof that any complex manifold is orientable.

43. Find a polynomial in two complex variables whose zero set is a complex curve homeomorphic to the sphere with two handles.

44. Let M is a complex manifold and suppose X is a nonvanishing vector field on M. Prove that there exists another nonvanishing vector field Y linearly independent of X.

45. Represent the torus $\mathbb{T}^n$ as a linear group.

46. Prove that the group of affine transformations of $\mathbb{R}^n$ is isomorphic to a Lie subgroup of $GL(n+1, \mathbb{R})$. Calculate its dimension.