MATH 510 HOMEWORK 1
FALL 2023
Due Thursday, August 31

Read Miranda, Sections 1.1–1.3

Problems. Problems to be turned in for grading

1. Problem I.1.F

2. Prove the statements on page 4 of the text
    (a) Two complex atlases are equivalent if and only if their union is also a complex atlas
    (b) Every complex atlas is contained in a unique maximal complex atlas *Hint: use Zorn's lemma*
    (c) Two atlases are equivalent if and only if they are contained in the same maximal complex atlas

3. Problem I.2.A

4. Consider the affine plane curve C associated with the polynomial
$$F(x, y) = x^2 + y^3 + 1.$$
   Show that C is nonsingular and exhibit an explicit atlas.

Additional Problems. These problems are also to be done, but will neither be collected nor graded.

1. Problem I.1.A

2. Problem I.1.G

3. Problem I.1.H

4. Problem I.2.C

5. Problem I.2.I