MAT 615: Complex Curves and Surfaces

Problem Set 2
Written Solutions (if any) due by Wednesday, 03/01, 9:45am

Please figure out all of the problems below and discuss them with others.

If you have not passed the orals yet, *you are encouraged to write up concise solutions to problems adding up to 10 points in total.*

Problem 1 (5 pts)

Describe all special divisors on a smooth compact Riemann surface of genus 0,1 and 2.

Problem 2 (5 pts)

Let $C, D_1, D_2 \subset \mathbb{P}^2$ be smooth cubics so that

$$C \cdot D_1 = \sum_{i=1}^{i=9} p_i$$

as divisors on C and D_2 passes through $p_1, \ldots, p_8$. Show that $p_9 \in D_2$.

Problem 3 (5 pts)

Let $C \subset \mathbb{P}^n$ with $n \geq 3$ be a smooth (connected) curve of genus 1 and degree 4. Show that C is contained in some linearly embedded $\mathbb{P}^3 \subset \mathbb{P}^n$ and is the intersection of two quadric (degree 2) surfaces in that $\mathbb{P}^3$.