Due Date: 14 February 2012, Tuesday   NAME:...

Ali Sinan Sertöz   STUDENT NO:...

Math 431 Algebraic Geometry – Homework

1	2	3	4	TOTAL
10	10	10	10	40

Please do not write anything inside the above boxes!

Notes: This homework is about the first chapter of the textbook. Almost all the answers are there. Read the chapter and write your answers in your own words in a way to convey the impression that you understood what is involved.

Q-1) On page 2, the author says "...which are accurate *topological* pictures of the curves but which do not reflect the way they sit inside $\mathbb{C}^2$." Explain what she means. Give an example (Hint: There are some examples a few lines below!)

Answer:

Q-2) What is Fields Medal in mathematics? List all people whose Fields Medal citations referred to their work in algebraic geometry. (This is not in the book. Some Googling is required. No copy-pasting will be tolerated!)

Answer:

Q-3)

    i Section 1.2.1 end with the words "Whether that finite number is ever nonzero, nobody knows."

       What is that number? How does she conclude that it is finite? The book was written in 1992. Is there any progress on this topic since then?

    ii The author claims that "... singularities [of curves] are important in many parts of mathematics..." What examples does she mention? How does she relate the existence of singularity on a curve with the existence of tangents?

   iii The author gives two examples to show that the theory of real curves is different than the theory of complex curves. What are these examples?

Answer:

Q-4)

      i What is a conchoid and how do we use it to trisect an angle?

      ii What is a cissoid and how can we use it to solve the Delian problem?

     iii What is a cycloid and which famous problem does it solve?

Answer: