

Math 496, Fall 2012: Final Homework

Due Friday December 7

Instructions:

1. Return to **Room D-323 Wells Hall** (my office) by the noon of Friday December 7.
2. Please slide your paper under my office door.
3. Have your paper stapled with this page attached to it and write your name clearly.

Problem 1: Solve exercise 2.14 on page 46 of the book.

Problem 2: Solve exercise 2.16 on page 47 of the book.

Problem 3: Solve exercise 4.21 on page 98 of the book.

Problem 4: Solve exercise 4.22 on page 99 of the book. Justify your answers with proofs or use of theorems you know!

Problem 5: Find the genus of a knot obtained by connect sum of 64 copies of the Figure-8 knot. Justify your answers with proofs or use of theorems you know!

Problem 6: Prove that the value of the Alexander polynomial $\Delta_K(t)$ at $t = 1$ is equal to 1 for every knot K . That is we have

$$\Delta_K(1) = 1,$$

for every knot K . What can you say about the value $\Delta_L(1)$, if L is a link with at least two components?

Problem 7: On the knot table on pages 280-281 of the book there is a total of 10 knots with six or seven crossings. You are told that exactly one of them is *amphicheiral*. Determine which one it must be. Justify your answers with proofs or use of theorems you know!

(**Note:** You might find reading chapter 6.4 of the book helpful.)