DUE: TUESDAY MARCH 15, 2011

There will be a two-hour long final homework/final exam review session on Monday March 14 late afternoon (time and place to be announced on the class website). All completed homework sets should delivered either to my office (if I am present) or to my ISB mailbox by 2 pm on Tuesday March 15. No late homeworks will be accepted.

FINAL EXAM ALERT: On Wednesday, March 16, there will be a three-hour in-class exam from 4–7 pm. The exam will take place in our usual classroom (Physical Sciences Building, Room 110). During the exam, you may refer to the textbook, the class handouts, solutions to homeworks, exams and practice problems, or your own personal notes. The exam will cover all the material treated during this quarter, which includes Chapters 1, 2, 3, 10 and 11 of Boas and all ten homework sets. There will be a slight emphasis on the material from the second half of the quarter, but you can be sure that you will be asked to expand something at some point during the exam.

To receive full credit for the following problems, you must exhibit the intermediate steps that lead you to your final results.

1. Boas, p. 501, problem 10.2–3.

HINT: What is the relation of this problem to problem 1 of Homework set 9?

2. Boas, p. 502, problem 10.2–7.

3. Boas, p. 505, problem 10.3–3.

4. Boas, p. 505, problem 10.3–9.

5. A symmetric tensor satisfies $S_{ij} = S_{ji}$, whereas an antisymmetric tensors satisfies $A_{ij} = -A_{ji}$. Prove that

$$S_{ij}A_{ij} = 0\,,$$

where there is an implicit sum over the repeated indices i and j (which can take on the values $1, 2, 3$) following the summation convention described on p. 502 of Boas.

HINT: What is the relation of this problem to problem 4 of Homework set 8?

6. Boas, p. 508, problem 10.4–5.

7. Boas, p. 513, problem 10.5–6, parts (b), (d) and (f).

8. Boas, p. 514, problem 10.5–10, part (a).

9. Boas, p. 514, problem 10.5–14.

10. Boas, p. 517, problem 10.6–15, parts (a), (b) and (c).