MATH 337
INTRODUCTION TO SOLITON THEORY
Homework set 3

April 3, 2012
Due April 12 , 2012

PROBLEMS.
The Boussinesq equation is given by

$$u_{tt} - u_{xx} + 3(u^2)_{xx} - u_{xxxx} = 0 \tag{1}$$

1. Show that the bilinear form of the Boussinesq equation is

$$(D_t^2 - D_x^2 - D_x^4)(f \cdot f) = 0 \tag{2}$$

where $u = -2\,\partial^2/\partial x^2\,(\log f)$.

2. Find $N = 1$ and $N = 2$ soliton solutions of the Boussinesq equation.