MATH 4250/6250, Problem Set 13
Due Friday, April 24

A. Show that the description of the tractrix curve given in class is equivalent to the description given by Oprea.

Class description (4/17): $\vec{\alpha}(w) = (g(w), h(w))$,

$$h(w) = Ae^{aw}, \quad g(w) = \pm \int_0^w \sqrt{1 - a^2 A^2 e^{2at}}\, dt + D$$

Oprea's description (p.121-122): $\vec{\alpha}(u) = (g(u), h(u))$,

$$g(u) = u, \quad h' = -\frac{h}{\sqrt{c^2 - h^2}}$$

Note: You do not have to find Oprea's h explicitly to show that these two descriptions are equivalent. For extra credit, however, you can find h by solving the differential equation given by Oprea. (See exercise 3.3.11.)

B. Problems from Oprea:
(5.1.1), (5.1.2), (5.1.3), (5.1.9), (5.1.10), (5.1.12), (5.1.13)