ME 115(a): Homework #2

(Due Friday January 29, 2010)

Problem 1: (15 points) Consider the Elliptical Trammel shown in Figure 1. Show that the moving centrode (the set of instantaneous pole locations, as described in a reference frame fixed to the moving body) forms a circle whose radius is $\frac{|\mathbf{AB}|}{2}$ and which is centered at the mid-point of the line segment \mathbf{AB} .



Figure 1: Diagram of the Elliptical Trammel, showing the fixed and moving centrodes (dashed circles).

Problem 2: (15 points)

- (a) Show that a rigid body undergoing spherical motion possesses 3 degrees-of-freedom.
- (b) Problem 7 in MLS Chapter 2.

Problem 3: (5 points). Problem 3(c) in MLS Chapter 2.

Problem 4: (10 points). Problem 4(a,b) in MLS Chapter 2.

Problem 5: (10 points). Problem 10(b,c) in MLS Chapter 2.