

CDS 270: Homework #1

(Due Friday April 15, 2011)

This homework is primarily intended to encourage students who have not taken ME 115 to read Chapter 2 of MLS and brush up on their rigid body kinematics.

Problem 1: (5 points) Problem #2 in Chapter 2 (page 73) of the MLS text.

Problem 2: (10 points) Problem #4 in Chapter 2 (page 73) of the MLS text.

Problem 3: (10 points) Problem #10(*b, c*) in Chapter 2 (page 75) of the MLS text. It is not necessary to answer the question about surjectivity.

Problem 4: (10 points) In class we used the particle nature of rigid bodies to “prove” that a planar rigid body has three degrees of freedom. Use the same idea to “prove” that a body undergoing spherical motion (where one point is fixed through the motion) has three degrees of freedom.

Problem 5: (20 points) Problem #11(*a, b, e*) in Chapter 2 (page 76) of the MLS text. It is not necessary to answer the question about surjectivity.

Problem 6: (10 points) Problem #14(*a, b*) in Chapter 2 (page 77) of the MLS text. It is not necessary to answer the question about surjectivity.