

## **EEL 4612 Homework 4**

**Due in Webcourses**

1. In Example 10-5 in your textbook, we saw in class that the inverted pendulum system as modeled does indeed have an integrator in the forward path. Thus, to get zero steady state error to a step input, insertion of the addition state  $\xi$  is not needed as shown in that Example. Design a Type 1 servo system without introducing the additional state to meet the same specs as given in the Example. Comment on the location of the closed-loop zeros. Use final-value theorem to show that the closed-loop system has zero s-s error to step input. Sketch the step response of the system. Use MATLAB wherever appropriate.